GAINS AND LOSSES IN THE EYES OF THE BEHOLDER:

A COMPARATIVE STUDY OF FOREIGN POLICY DECISION MAKING

UNDER RISK

A Dissertation

by

YI YANG

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2004

Major Subject: Political Science

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Approved as to style and content by:

Alex Mintz (Chair of Committee)	Di Wang (Member)
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ABSTRACT

Gains and Losses in the Eyes of the Beholder:

A Comparative Study of Foreign Policy Decision Making Under Risk. (December 2004)

Yi Yang, B.A., Foreign Affairs College

Chair of Advisory Committee: Dr. Alex Mintz

Prospect theory is a descriptive model of individual decision-making under risk (Kahneman and Tversky 1979). The central tenet of prospect theory posits that the risk orientation of decision-makers is affected by the gains vs. losses domains in which they are situated. Individuals are predicted to be risk-averse in the domain of gains and risk seeking in the domain of losses. Although prospect theory made significant contributions to decision theory, it has important limitations. Foremost, as noted by Levy (1997a), prospect theory is not a complete theory of decision-making. Like rational choice theory, prospect theory attempts to explain choices or outcomes, not the processes through which those choices come about (Abelson and Levi 1985, 235).

In response to this limitation of prospect theory, this dissertation intends to address the following set of puzzles:

Do gains vs. losses domains affect the decision processes in foreign policy decision making? If so, in what way will decision strategies change? That is, what strategies are most likely to be employed when the decision maker is in the domain of gains? And, in contrast, what strategies are the most likely to be utilized when the decision maker is in the domain of losses?

To address these questions, I develop and extend prospect theory to account for the impact of gains vs. losses domains on decision strategy selections by decision makers under risk. A set of testable hypotheses are then derived.

To render a robust test of these hypotheses, I employ a cross-national experimental research design, utilizing American subjects first and then replicating the same experiment with subjects in mainland China. In terms of research instrument, I utilize the computerized decision process tracer – the Decision Board Platform. Specifically, the "moves" of decision makers are recorded by the Decision Board and then used to identify choices and to infer specific decision strategies.

Statistical analysis of the experimental results demonstrates support for the major hypotheses. A decision maker in the domain of gains is more likely to employ a holistic, alternative-based, compensatory, and maximizing decision strategy than is a decision maker in the domain of losses.

DEDICATION

To my parents, Xuedai Wei and Zhenmin Yang, with love and respect.

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At last, I get to acknowledge all those who have been so important to this project, and there are so many people I need to thank for their advice, help, and support during the time I have endeavored to complete this dissertation. I must admit that this dissertation could not have finished without the help and support of family, friends, and mentors.

First, I am truly grateful for the wisdom, encouragement, and support of my committee, beginning with my chair, the indispensable Alex Mintz. Without his insights, encouragement, and guidance, I would not be writing the final pages of a completed dissertation.

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Liu have offered me their help, support, and valuable friendship. I cannot survive without a community of friends.

I am grateful for the love and support of my fiancée, Melanie Hart. I am so lucky to have her love.

Finally, I wish to thank my parents, Xuedai Wei and Zhenmin Yang, for their patience, support, and sacrifice. This study is dedicated to them.

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CHAPTER I

INTRODUCTION: GAINS VS. LOSSES, DECISION STRATEGIES, AND CHOICES IN FOREIGN POLICY DECISION MAKING

On April Fools Day 2001, an American EP-3 surveillance plane and a Chinese F-8 jet fighter collided over the South China Seas. The EP-3 made it safely to China's Hainan Island; the F-8 tore apart and crashed and pilot Wang Wei is now presumed dead. A few days later, China's Ministry of Foreign Affairs called an unusual late-night news conference. Spokesman Zhu Bangzao, his rage clearly visible, declared: "The United States should take full responsibility, make an apology to the Chinese government and people, and give us an explanation of its actions." Foreign Minister Tang Jiaxuan and President Jiang Zemin soon reiterated this demand.

U.S. Secretary of State Colin Powell initially responded with equal bluntness: 'We have nothing to apologize for'. Viewing the aggressiveness of the Chinese jet as the cause of the collision, American did not feel responsible. As Senator Joseph Lieberman said on CNN's *Larry King Live*, 'When you play chicken, sometimes you get hurt'.

The impasse was broken after 11 days of intensive negotiations. Ambassador Joseph Prueher gave a letter to Foreign Minister Tang: 'Please convey to the Chinese people and to the family of pilot Wang Wei that we are very sorry for their loss … We a re very sorry for the entering of China's airspace and the landing did not have verbal

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This dissertation follows the style and format of the *Journal of Politics*.

clearance'. Having extracted an 'apology' from Washington, Beijing released the 24 American servicemen.

This incident in Sino-U.S. relations itself and the demonstrated behavior of decision makers from both countries during the crisis posed some interesting questions to students of foreign policy decision making. For example, during this dragging crisis that lasted for 11 days, leaders of both sides showed very tough stands, once making observers ponder that it might trigger more hostile confrontations. The Chinese government insisted on soliciting an apology and financial compensations from the U.S. government. The U.S. side, instead, denied any misconduct on this matter and demanded that the Chinese government return the plane and the crew immediately. It is natural that we ask that what factors contribute to the risk-seeking oriented responses from both sides.

Prospect theory may partially answer the question. Developed by Kahneman and Tversky (1979), prospect theory posits that the domains, gains vs. losses, in which decision makers are situated will affect their risk propensities. Specifically, decision makers are risk-seeking in the domain of losses, and in contrast, risk-averse in the domain of gains. During the EP-3 spy plane crisis, the risk-seeking behavior of both China and the US can be contributed to the fact that both countries were in the domain of losses. The Chinese decision makers perceived themselves to be in a domain of losses for a number of reasons. First, the incident was framed by the media as an invasion of the U.S. spy plane into Chinese airspace. Second, the incident resulted in the losses of both the pilot and the jet fighter. For the U.S. decision makers, the perception of being

in the domain of losses came simply from the detainment of the crew, the refusal to return the plane, and the public demand for an apology from the Chinese counterparts.

For students of foreign policy decision making, however, that is only part of the answer. By treating gains vs. losses domains as the main explanatory variables, prospect theory can enlighten us on what kind of decisions are likely to be made. Yet, prospect theory cannot explain *how* leaders make these decisions. Beginning with the seminal work of Snyder, Bruck, and Sapin (1962), scholars have attempted to ascertain and determine factors that influence both foreign policy processes as well as outcomes. Much of the previous literature focused on either the processes of decision making or on the outcome of a decision, like the case with prospect theory. Even those studies that have addressed both have generally focused on one at the expense of the other.

Purpose

In light of the above discussions, this dissertation will center on the following set of puzzles: Do gains vs. losses domains affect the manner in which decisions are made in foreign policy decision making? If so, in what way will decision strategies change? That is, what strategies are most likely to be employed when the decision maker is in the domain of gains? And, in contrast, what strategies are the mostly likely to be utilized when the decision maker is in the domain of losses?

By aiming to resolve these puzzles, this dissertation seeks to make a substantive as well as a methodological contribution to the field of foreign policy decision making. Substantively, its goal is to demonstrate the effects of gains vs. losses domains on foreign policy decision making processes as well as on foreign policy outcomes.

Methodologically, its aims are to present that, through the use of process-tracing methods and an internet-based computerized decision process tracer – the Decision Board (Version 4.0), both process and outcome validity can be attained in studies of comparative foreign policy decision making.

Conceptual Framework

Prospect theory was first introduced by Kahneman and Tversky (1979), and has since become one of the leading alternatives to rational choice as a theory of decision under risk (see also Levy 1992a, 1992b, 1997a, 1997b). One of the most significant weaknesses of prospect theory is, as pointed out by Levy (1997a), that it is not a complete theory of decision making. As a theory of choice under conditions of risk, prospect theory focuses only on explaining choices given the basic parameters of the decision problem – the available options, the possible outcomes of each option and the values and probabilities associated with each, and the framing of the reference point (ibid.). These basic parameters are taken as given and treated exogenously. This is an important limitation of the theory, particularly for the purposes of explaining the complex world of international politics (1992a, 1997a, 1997b). A complete understanding of international politics lies in not only the choices that decision makers make but also the decision processes through which decisions are made. Prospect theory currently has little to say about the decision making process.

To address this issue and to enhance our understanding of foreign policy decision making behavior under risk, I develop and extend prospect theory to account for the

impact of gains vs. losses domains on decision strategy selections by decision makers under risk.

General Overview of the Research Project

In exploring the role of gains vs. losses domains play in both processes and outcomes in foreign policy decision making under risk, this dissertation seeks to analyze and discuss several topics, organized by chapters. The topics to be addressed are briefly presented below, and are more fully developed in the substantive chapters that follow.

Theories of Decision Making: Rational Choice vs. Prospect Theory

A fundamental interest of political analysis for many years has been the desire to know how politicians and national security leaders make decisions. From studies of voting behavior and policy adoption to decisions made in a foreign policy crisis, scholars have attempted to determine how and why decision makers choose a particular alternative from among a portfolio of available course of action.

Among the endeavors to disentangle this puzzle, rational choice theory has been the dominant approach. It has come to dominance because it provides two valued elements to policy analysis – parsimony and rigor. Problems can be reduced to selecting courses of actions, each with a corresponding set of outcomes, and weighing these against a set of preferences (Allison 1971, 29-30). Yet, rational choice, since the date of its birth, has been facing criticisms mostly due to the plethora of observed deviations from its general predictions. Along with the criticisms came the efforts to construct alternative theories of decision making, among which prospect theory is the leading one.

In Chapter II, I examine and compare rational choice and prospect theory. Specifically, I focus on discussing and comparing their basic assumptions and how they conceptualize the decision making process and choice. I then discuss criticisms of both theories. In Chapter III, I review the extant literature in international relations applying prospect theory. In particular, I focus on works based on the theoretical premise that risk propensities are affected by gains vs. losses domains.

Extending Prospect Theory in Foreign Policy Decision Making under Risk

Prospect theory in its current stage only focuses on explaining and predicting choices. To develop into a full-fledged theory of decision making, prospect theory must include decision processes. In Chapter IV, I intend to embark such an effort. Specifically, I look at the effects of gains vs. losses domains on decision processes in foreign policy decision making. First, I briefly discuss the literature pertaining to decision making strategies in foreign policy decision making. Second, I examine the effects of gains vs. losses domains on the selections of various decision strategies during a decision making process. Third, I summarize those effects by presenting empirically testable hypotheses.

Process-Tracing Method and Research Design

In order to test the effects of gains vs. losses domains on processes and choices in foreign policy decision making under risk, I utilize process-tracing techniques. I employ a cross-national experimental research design, using an internet-based computerized process tracer that records the “moves” that subjects make as they acquire information during the computer simulation. To strengthen the validity of the results, I first used

American subjects and then replicated the same experiment with Chinese subjects in mainland China. Subjects are first presented with a foreign policy crisis decision scenario and then they are faced with a decision matrix composed of alternatives and evaluations of these alternatives across substantive dimensions. Subjects can access information from the computer by clicking on an "information bin." This information bin contains a written evaluation of the alternative as given by an adviser as well as numerical score representing the attractiveness of an alternative on a specified scale.

The data generated by the subjects is then analyzed via ANOVA and other statistical techniques. I am able to determine how different independent variables affect a decision maker's selection of decision processes, i.e., decision rules and strategies, as well as his/her choices.

Organizationally, In Chapter V, I review experimental method and its contributions to the study of international relations, along with its strengths and weaknesses. In Chapter VI, I focus on process tracing techniques. I discuss decision tasks and matrices as well as decision rules and strategies. I examine various process tracing techniques in general and then narrow the focus to uses in foreign policy decision making. I also concentrate mostly on the ways in which information boards have been used as a process-tracing device. I then discuss empirical measures and indicators of decision strategies. In Chapter VII, I present the cross-national experimental design and experimental procedure. I also introduce the computerized decision process tracer – the Decision Board platform (Version 4.0) – as the experimental instrument. In Chapter VIII, I report the experimental results on the effects of gains vs. losses domains on

decision processes and choices. Analysis of experimental results demonstrated that both American and Chinese subjects behaved in consistence with major hypotheses presented in Chapter IV.

In Chapter VIII, I also discuss the dissimilarities between Chinese and American decision makers based on the cross-cultural psychology literature. Most of the discussions on the applications of prospect theory to international relations assume that the risk orientation of decision makers is determined primarily by the framing of losses or gains around a reference point (Levy 1992a). This is a very strong assumption. As noticed by Levy (ibid.), attitudes toward risk can be affected by idiosyncratic, cultural, political, ideological, and other decision-making variables as well as framing effects. In particular, in understanding risk taking behavior, culture-based attitudes are more pertinent than any other attitude in unfamiliar, ill-defined, and ambiguous situations in which decision makers look for cues that will allow them to interpret and make sense of available information, that will provide guidelines for responding, and that will give them reasonable confidence in the chosen interpretation and response (Doty 1986; Gaenslen 1986; Vertzberger 1998). Relying on the existing literature in cross-cultural psychology, I argue, in Chapter VIII, that cultural differences between the Chinese and the Americans may have resulted in the dissimilarities in decision making behavior as shown in the experimental analysis.

Chapter IX concludes the study by reviewing the major findings of this research. Implications of the findings as well as suggestions for further research are also discussed.

CHAPTER II

THEORIES OF DECISION MAKING

Introduction

A fundamental interest of political analysis for many years has been the desire to know how politicians and national security leaders make decisions. From studies of voting behavior and policy adoption to decisions made in a foreign policy crisis, scholars have attempted to determine how and why decision makers choose a particular alternative from among a portfolio of available course of action.

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In the chapter, I will examine and compare rational choice and prospect theory. Specifically, I will focus on discussing and comparing their basic assumptions and how they conceptualize, explain, and predict the decision making processes and choices.

Rational Choice Theory

What is rational choice? According to Morrow (1997, 12) rational choice is "a simple idea: Actors do what they believe is in their best interest at the time they must

choose. Stated this way, the idea is so simple as to be innocuous." Thus stated, just about any theory of choice could qualify as "rational." In fact, Simon (1995, 45) notes that "by a weak definition of rationality, virtually all human behavior is rational. People usually have reasons for what they do, and if asked, can opine what these reasons are."

From the perspective of rational choice theory, decision problems can be reduced to selecting course of actions, each with a corresponding set of outcomes, and weighing these against a set of preferences (Allison 1971, 29-30). Uncertainty, or risk associated with the decision, can be dealt with by an expected utility model that predicts that probable outcomes of any decision based on its utility and the probability of achievement (March 1994, 3). Implied in this description is that the selection of a course of action is the result of a consistent scheme of preferences and expectations, the weighing of these alternatives, and the selection of one based on these calculations (Russett, Starr, and Kinsella 2000, 147-8; Shubik 1982, 81-2).

Contemporary rational choice theory has been developed in works by von Neuman and Morgenstern (1947), Arrow (1951), Buchanan and Tullock (1962), Downs (1957), Riker (1962), and Olson (1965). Among these rational choice theorists, von Neuman and Morgenstern, who laid down many foundations of contemporary rational choice approach, are seen as the earliest and most significant students of the expected utility/rational choice theory.

Rational choice theory exists in many different forms with variations centering on what are considered the most critical assumptions (Green and Shapiro 1994). It sees the selection of particular options as the result of a reasoned process involving the

weighing of costs and benefits and selecting those options with the highest outcome or lowest cost. Decision makers are assumed to know what they want and what their priorities are. Those ordered goals form a preference set against which courses of action are evaluated. Decisions are conditional on the answers to questions of alternatives, expectations of utility, individual preferences and decision rules (de Rivera 1968, 107; March 1994, 40; Riker 1995, 24-5). "The fundamental assumption … is that everything there is to know about a situation is known at the start by 'rational players,' and 'stays put' as they reason the situation." (Rapoport 1999, 143)

Leaders in the international arena are assumed to act consistent with this manner of making decisions due to the normative sense of rationality. Populations do not like to think that the decisions of their leaders are the result of whim or chance. There is an implicit assumption that leaders act to achieve maximum benefit to the state in the expenditure of resources (Richardson 1993, 140; Riker 1995, 24). "The leader is assumed to be a rational utilitarian interested in maximizing his own welfare. His welfare, in turn, is assumed to be intimately tied to the overall costs and benefits imposed on the society by his foreign policy" (Bueno de Mesquita 1981, 29).

Assumptions

The core assumptions of rational choice are identified by (Green and Shapiro 1994). I hereafter present these assumptions.

Utility

Decisions are based on the utility of an outcome and a probability distribution with alternatives weighed based on the expected utility of that outcome. That is, given a set

of choices $[A]$ with an associated probability distribution $[P(a)]$, each element or course of action $[A]$ has a utility $[U(a)]$. The expected utility of any action $[EU(a)]$ is the product of the utility and the probability $[EU(a) = U(a) \times P(a)]$ (Morrow 1994, 22; 1997, 13).

Maximization

Decision makers select alternatives that best match individual preferences for the achievement of a set of goals. Decision makers will choose that alternative for which the expected utility of one course of action is greater than the expected utility of another course of action [$EU(a^*) \geq EU(a)$ for all acts a in A] (Winkler 1972, 264). Within this core assumption is an implied assumption that the decision maker has preferences over the set of acts *A* and will select a course of action that best meets these preferences. These may also be phrased as criteria or decision rules (Morrow 1994, 18-19).

Invariance

Models of decision making that use pure rational choice assume that decisions, rules and preferences are stable over time or invariable (Allison 1971, 29; Green and Shapiro 1994, 14). This principle requires that the preference order among outcomes does not depend on the manner in which they are described. This assumption has come under the greatest criticism.

Transitivity

Associated with this assumption is the tenet that all alternatives can be rank ordered and that these rankings are consistent among themselves (Shubik 1982, 418). This is illustrated by the following logic: if A > B and B > C, then A > C. This means

that for any set of courses of action, all of them have a rank ordering that does not change even if intermediary courses are no longer possible. If this assumption is not true, then any outcome has the possibility of being selected (Bueno de Mesquita 1981, 32).

Unitary Actors

This final assumption characterizes the decision maker more than the decision process. Although it is obvious that in modern organizations decisions are not made solely by individuals, this assumption is a functional reduction for the purpose of analysis. By permitting the grouping of individual identities within the decision making process into a single identity, this assumption allows analysts to "black box" the system and to develop parsimonious theories. Any individual or group having a unitary interest motivating decisions is treated as an individual (Green and Shapiro 1994, 15; Luce and Raiffa 1957, 13; Morrow 1997, 14).

Rational choice theory provides a framework in which complex problems can be broken into specific identified component parts. These components can then be used for the evaluation and selection of courses of action based on specified criteria. To summarize, let $(x, p; y, q)$ denote an alternative that yields x with probability p and y with probability q and that preserves the status quo with probability $(1 - p - q)$. The expected utility/value of the alternative $(x, p; y, q)$ is calculated, by a rational decision maker, as:

$$V = xp + yp$$

Rational choice approaches in foreign policy analysis and international relations have centered around several important contributions made by Bueno de Mesquita (1981,

1983, 1984, 1989), Bueno de Mesquita and Lalman (1990, 1992), and others (see e.g., Morgan and Bickers 1992; Morrow 1985, 1994; Wittman 1979).

Criticisms

"While the utility model is easily conceptualized and allows us to get a grip on the decision making process, it does not seem to match a closer inspection of what actually occurs when a person is making a decision" (de Rivera 1968, 112). Early criticisms of rational choice theory occurred when it became evident that there were several decision problems and behavior patterns that did not match the predictions of expected utility models.

First, uncertainty and lack of credible information is a major factor in most decision making situations. It is more so in international relations where ambiguity and secretiveness are paramount and decision makers cannot be certain of the reaction of other states (Luce and Raiffa 1957, 14; Morrow 1989, 207; Richardson 1993, 129; Simon 1985, 294; Vertzberger 1998, 76; Zagare 1984, 14). Second, the problem is not structural, but individual. Humans are not the efficient information processors implied by rational choice. Individuals search information selectively to discover available alternatives. This search is often incomplete, inadequate, and based on uncertain or flawed information. Very often, termination of information gathering or processing occurs when satisfactory solutions appear (Mintz and Geva 1997; Mintz et al. 1997; Mintz 2004a, 2004b).

The next set of criticisms centered on the assumption of utility maximization and invariance. The idea of utility, so vital to rational choice and utility theory, is

problematic. Differences between decision utility (possible outcomes defined by both sign and weight), experienced utility (possible outcomes defined by quality and intensity), and predicted utility (possible outcomes defined by individual beliefs about the experienced utility) made it questionable whether people really knew what they wanted (Kahneman and Snell 1997, 407). As knowledge increased, it became apparent that decisions were not the result of utility maximization. Faced with conflicting values, time constraints, and a lack of information, a decision maker will opt for strategies other than maximization (Mintz and Geva 1997; Mintz et al. 1997; Mintz 2004a, 2004b).

Rational choice is also problematic for decisions under risk because of its failure to consider motives for risk taking. Placing risky decisions within the proper context is essential for realistic determinations of the risk attitude of the decision maker (Vertzberger 1998). Proof that perceptions of probabilities can be changed by the way a problem is represented – resulting in changes to the preferences – is strong across the spectrum from sophisticated to naïve decision makers. This malleability of preferences goes directly against the tenet of rational choice about invariance (Kahneman and Tversky 1984; Shafir, Simonson and Tversky 1997; Tversky and Kahneman 1986). Recent research also suggests that the decision process itself is dynamic. Decision makers may use a mix of strategies, going through different stages. Choices made sometimes are clearly suboptimal, depending on situational constraints and the decision makers' evaluation of the possible political gains and losses associated with the outcome (see e.g., Mintz and Geva 1997; Mintz et al. 1997; Mintz 2004b).

Prospect Theory

A common theme in the critique of rational choice theory is how it deals (or does not deal) with risk. Prospect theory was first introduced by Kahneman and Tversky (1979), and has since become one of the leading alternatives to rational choice as a theory of decision under risk (see also Levy 1992a, 1992b, 1997a, 1997b).

Simply put, prospect theory decision making is basically divided into two stages, *editing* and *evaluation*. In the first stage, the different choices are ordered following some heuristic so as to let the evaluation phase be simpler. The evaluations around losses and gains are developed starting from a reference point. The value function which passes through this point is S-shaped and as it is asymmetric implies, given the same variation in absolute value, a bigger impact of losses than of gains.[1]

According to prospect theory, in the first stage, the *editing* stage, contrary to rational choice, which assumes invariance and transitivity, actually decision making behavior appears to be substantively affected by the method, order, or manner of presentation. Editing is an integral component of the choice process with coding, simplification, and cancellation of probabilities or outcomes. Once the individual edits the available options, she then evaluates the edited prospects and selects the one with the highest value, as determined by the product of a value of an outcome (value function) and a decision weight (weighting function) (Levy, 1992a).

The *evaluation* phase involves two distinct functions, the value function and the

[1] I am indebted to Professor B. Dan Wood for recommending to me a concise and clear summary of prospect theory.

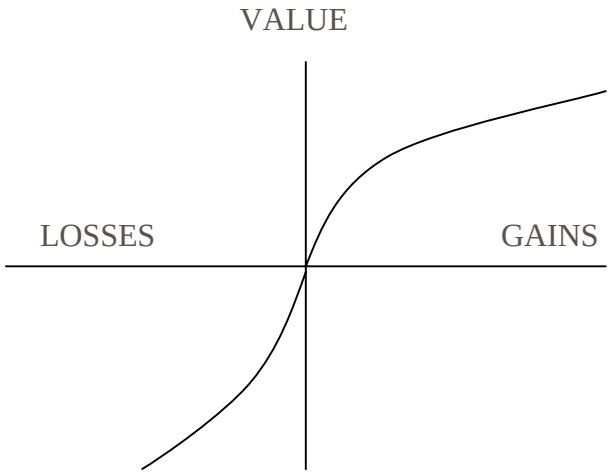
weighting function. The value function presents at least three notable properties that distinguish it from expected utility models (see Figure 2-1). First, outcomes tend to be evaluated in terms of gains and losses relative to a status quo reference point, rather than in terms of final outcome positions. For example, an expected utility model assumes that a gambler who stated with $1 and gained $1,000 is the same as one who started with$1,000 and gained $1; each now has $1,001. In prospect theory, in contrast, the person who gained $1,000 would be understood to be much happier than the one who gained $1, because the change or shift represents a greater positive move away from the previous status quo position.

Second, the value curve is concave for gains and convex for losses. In other words, people tend to be risk-seeking in the domain of losses and risk-averse in the domain of gains. Prospect theory predicts that domain affects risk propensity.

Last, the value curve is much steeper for losses than for gains. That implies that losses hurt more than equal gains please even if their share the equivalent absolute values. In other words, losing $10 hurts more than finding $10 pleases.

The weighting function transforms the expected utility notion of subjective probability assessment into more psychologically descriptive terms. In prospect theory's weighting function, low-probability events tend to be given too much weight in decision making, whereas medium- and high-probability events are given too little weight, relative to standard normative probability model. For example, travelers may know that the objective risk of a plane crash is quite low, but their subjective risk may feel much greater. On the other hand, given the moderate to high probability of heart disease, not a

Figure 2-1: Hypothetical Value Function



lot of people would give up smoking and unhealthy diets, which are the main causes for heart disease.

Prospect theory rests on a foundation of experimental empirical evidence (Kahneman and Tversky 1979, 1984; Tversky and Kahneman 1986, 1992). Kahneman and Tversky set out to develop a theory of decision making that was descriptively accurate, even if normatively objectionable (McDermott 1998). Mathematically, prospect theory can be formulated as follows:

Let $(x, p; y, q)$ denote a prospect that yields x with probability p and y with probability q and that preserves the status quo with probability $(1 - p - q)$. In contrast to rational choice theory,[2] prospect theory posits that there are values $v(\cdot)$, defined on gains and losses, and decision weights $\pi(\cdot)$, defined on stated probabilities, such that the utility/value of the prospect equals:[3]

$$V = \pi(p)v(x) + \pi(q)v(y)$$

Prospect theory posits that, instead of evaluating net asset levels, individuals tend to think in terms of gains and losses, specifically choosing among options in terms of deviations from a reference point (ibid.). Reference dependence is the central analytic assumption of prospect theory (Levy 1997a; Tversky and Kahneman 1991). This reference dependence is in violation of the expected utility assumption of an individual utility function that is defined in terms of net asset levels. Reference dependence manifests itself when we see that an individual "may prefer *x* to *y* when *x* is currently a

[2] See utility function in page 23.

[3] See Tversky and Kahneman (1986, S257).

part of her endowment but prefer *y* to *x* when *y* is part of her endowment" (Levy 1997b, 35). This reference point is usually the status quo, but is not necessarily so. Levy (1992a) speaks of deviations from an aspiration level or even some other reference point that is not synonymous with the status quo.

A logical extension of reference dependence is the observation that individuals treat gains and losses differently. Specifically, individuals tend to overvalue losses relative to comparable gains (Levy 1992a, 1992b, 1997b). This is commonly referred to as loss aversion and implies that individuals tend to value what they have more than comparable items which they do not have, and that the utility of acquiring an item is not equal to the disutility of giving it up (ibid.; see also Tversky and Kahneman 1991). This overvaluation of the status quo is called the endowment effect (Thaler 1980). Levy (1997b) notes that the endowment effect has important ramifications for utility theory. "It challenges the assumptions that preferences are invariant under different representations of equivalent choice problems (because framing affects preferences) … and that preferences are independent of endowments (one's preference between A and B may depend on whether A is currently part of one's endowment" (Levy 1992a, 175; see also Kahneman, Knetsch, and Thaler 1990, 1991; Slovic and Lichtenstein 1983; Tversky, Slovic, and Kahneman 1990).

Another implication of loss aversion and the endowment effect is the tendency of individuals to stick with status choices (Levy 1997b). Individuals are understood to adapt to the steady state, or status quo, relatively rapidly. They are typically relatively satisfied with it, as well as averse to losing any component part of their present position.

This status quo bias (see;) posit that individuals consider the "costs of moving away from the status quo as losses and the benefits of moving away from the status quo as gains and then overweight the former relative to the latter; consequently, people stay at the status quo more frequently than expected utility theory would predict" (Levy 1997b, 35). This corresponds to the endowment effect in that people value what they possess, including the present situation, to a greater degree than they value an equally attractive alternative. This tendency presents interesting implications for political negotiations involving territorial disputes and arms control/reductions. Empirically, this status quo bias is also demonstrated in a number of experimental and field studies of consumer and investment behavior (see e.g., Kahneman, Knetsch, and Thaler 1991; Samuelson and Zeckhauser 1988).

Loss aversion is not the only dimension in the asymmetry of gains and losses. Another is the observance that individuals tend to be risk acceptant in the domain of losses, yet risk averse in the domain of gains (Levy 1992a, 1997a). Experimental evidence suggests that individual utility function is convex in the domain of losses but concave in the domain of gains, with a reflection effect around the reference point (Kahneman and Tversky 1979; Levy 1992a, 1997a, 1997b). This reflection effect suggests that the "sensitivity to changes in assets decreases as one moves further from the reference point in both directions, which would not be true of a utility function which was either strictly concave or strictly convex" (Levy 1992a, 174). This pattern has been found to hold true among various individuals and situations, but may break down for very small probabilities or for catastrophic losses (ibid.).

Because of this differential treatment of gains and losses and the importance of the reference point in determining outcomes associated with these domains, identifying the reference point, i.e., framing the choice problem can have a critical effect on choice (Kahneman and Tversky 1979; Levy 1992a, 1997a; Tversky and Kahneman 1981, 1986). Framing the choice problem in terms of gains vs. losses has significant impact on preferences regardless of whether or not the two representations are mathematically equivalent. Framing of the reference point is often predetermined by the situation, i.e., in static environments the status quo equals the reference point. However, under dynamic conditions the reference point is not so well defined and differences in the way individuals accommodate to gains and losses may affect the framing of the reference point (Levy 1992a, 1997a). For example, in a situation where there is a sequence of successive choices rather than a single choice, it is unclear where an individual will define his/her reference point. This may also hold true when the status quo is ambiguous (ibid.).

The issue of accommodating to gains and losses is fundamental in prospect theory. Prospect theory posits that individuals accommodate more rapidly to gains than to losses and that this accommodation occurs rather quickly (ibid.). This is referred to as the instant endowment effect (Kahneman, Knetsch, and Thaler 1990) and is very important because of the implications for strategic interactions in dynamic environments that often characterize international politics. "If A has just made a gain at the expense of B, B's attempt to recover his losses (from the old status quo) will be perceived as a potential loss by A (from the new status quo), so that both parties will be in a domain of

losses and be more risk-seeking" (Levy 1992a, 177-78; see also Levy 1992b). Jervis (1992), though, notes that after numerous losses individuals will not accommodate, or "renormalize," as rapidly but will instead adopt the cumulative frame and resort to risk-seeking behavior in order to prevent further losses. Levy (1997b, 37) notes that "this phenomenon raises some interesting questions regarding how different people accommodate to change, in what direction, how quickly, and under what conditions."

Because individuals can adopt frames that are based on expectation or aspiration levels rather than the status quo, and because the status quo may be ill defined in various dynamic conditions, the concept of a status quo is in reality inaccurate (Levy 1997b). Instead, the bias is actually a reference point bias, signifying a greater tendency to move toward the reference point than expected utility model would predict (ibid.). The implication is that "behavior varies depending on whether the glass is seen as half empty or half full" (Levy 1997b, 37).

Finally, prospect theory posits that, instead of a linear combination of utilities and probabilities, individuals tend to respond nonlinearly toward probabilities. Specifically, individuals tend to overweight outcomes that they believe are certain relative to those which they believe are merely probable (Kahneman and Tversky 1979). This certainty effect leads individuals to attach greater value to the complete elimination of risk than to the reduction of risk by a comparable amount (Levy 1992a, 1997b). Levy (1992a), referring to Quattrone and Tversky (1988), uses the example of Russian roulette, where people are willing to pay a higher price to reduce the number of bullets in the gun

from one to zero than from four to three, even though the changes in expected utility are identical.

Criticisms of Prospect Theory

Prospect theory has its disadvantages in application to cases in international relations. Several of these obstacles are particularly troublesome in attempting to examine political phenomena from a psychological perspective in general and through the lens of prospect theory in particular (McDermott 1998). The limitations of prospect theory were extensively discussed (see e.g., Levy 1992a, 1992b, 1997a, 1997b, McDermott 1998). Here I only focus on two major criticisms with regard to applying prospect theory in international relations, i.e., the exclusion of decision making processes and the neglect of the contributions of idiosyncratic, cultural, political, ideological variables in explaining risk taking behavior in foreign policy decision making.

One of the most significant weaknesses of prospect theory is, as pointed out by Levy (1997b), that it is not a complete theory of decision making. As a theory of choice under conditions of risk, prospect theory focuses only on explaining choices given the basic parameters of the decision problem – the available options, the possible outcomes of each option and the values and probabilities associated with each, and the framing of the reference point (ibid.). These basic parameters are taken as given and treated exogenously. This is an important limitation of the theory, particularly for the purposes of explaining the complex world of international politics (Levy 1992a, 1997b). A complete understanding of international politics lies in not only the choices that decision

makers make but also the decision processes through which decisions are made. Prospect theory currently has little to say about the decision making process.

In fact, these concerns apply as well to expected utility and other decision theories. How the variations in the structure and nature of decision tasks trigger different decision making processes and strategies and how decision makers come up with subjective utilities and probabilities, and the shape of the utility function are all exogenous to the model. In decision making research, the analyst often provides this information and in doing so introduces auxiliary assumptions that are a necessary component of any theory of choice (Levy 1997a, 1997b). In other words, by building decision theory upon these auxiliary assumptions, variances in decision making processes and the interactions between decision making processes and choices are largely ignored.

These auxiliary assumptions concern both the basic parameters of the decision task and the processes through which decision makers generate those parameters. Levy (1997b) rightly pointed out that although expected utility theory has been criticized for excessive reliance on the "as-if" assumption – for its focus on behavioral outcomes and exclusion of the question of how those outcomes are arrived – the same criticism can be made of prospect theory. Indeed, "Both expected utility and the evaluation phase of prospect theory are *structural* theories rather than *process* theories." (ibid., 42, italic original) Given certain parameters of the choice problem, they attempt to explain choices or outcomes, not the processes through which those choices come about (Abelson and Levi 1985, 235).

In Simon's (1976) terms, both expected utility theory and prospect theory are concerned with "substantive rationality" rather than "procedural rationality." Substantive rationality is a function of goals and situational constraints but not intervening reasoning processes. Procedural rationality, in contrast, depends on the appropriateness of the intervening reasoning processes (Simon 1976, 130-131). Whereas neoclassical economics and formal decision theory are concerned primarily with substantive rationality, most theories of judgment and choice in social psychology are primarily process-oriented (Levy 1997b). Once the editing phase of prospect theory is more fully developed, focusing more on decision making processes, it will embrace more similarities with cognitive decision making theories.

Prospect theory in its current form, focusing mostly on choices, demonstrates that it is an incomplete theory of decision making (Levy 1997b). Clearly, a theory that explains both the processes and choices of decision problems would be superior to prospect theory as it now stands.

The other criticism for prospect theory concerns the over-deterministic nature of the theory. Despite the strong explanatory power in international politics, prospect theory assumes that the situation, and not the attributes of the people involved, shapes behavior. Indeed, most of the discussions and applications of prospect theory in international relations assume that the risk orientation of decision-makers is determined primarily by framing losses or gains around a reference point, neglecting the fact that attitudes towards risk can also be affected by idiosyncratic, cultural, political, ideological, and other decision-making variables (Levy 1992b). Variations in these variables may

contribute to the differences in the definition of what people mean when they say that one prospect is riskier than another and the criteria by which decision makers actually compare relative risks among options. Therefore, exactly how decision makers will evaluate and compare the risks is highly uncertain and consequently it is difficult to predict how a risk-seeking (or risk-averse) actor will behave (Levy 1992b).

In international politics, leaders may differ greatly in their tolerance for risks, often with important political consequences (Kowert and Hermann 1997). All leaders face uncertainty and, with it, the prospect of error and failure. When the stakes are high, as during an international crisis, leaders' judgments and acceptance about risk become critical. Deterrence theory, for example, recognizes that individuals differ in their acceptance of risk. Some leaders are deterred more easily than others. As Kowert and Hermann (ibid.) pointed out, although the problems of risk and uncertainty are widely recognized by students of international relations, differences among individuals and social groups at various aggregated level are rarely examined in detail. Very often, they are treated as exogenous to whatever theory of decision under consideration. For example, Fearon (1995, 388) simply assumes that leaders are relatively risk invariant: "a risk-acceptant leader is analogous to a compulsive gambler – willing to accept a sequence of gambles that has the expected outcome of eliminating the state and regime. Even if we admitted such a leader as rational, it seems doubtful that many have held such preferences".

As opposed to Fearon's claim, less restrictive assumptions about risk propensities have been made. Bueno de Mesquita (1981) acknowledges that the shape of the utility

function for leaders facing decisions about warfare will vary according to their propensity to accept risk. In later work, Bueno de Mesquita (1985, 157) revisits the problem of risk with the intention of introducing "an endogenously derived, continuous measure of risk-taking propensities".

Prospect theory posits that people's willingness to take risks depends on how problems are framed and on the reference point that decision makers use to assess utility (Kowert and Hermann 1997). It directs attention away from individual and group differences and toward the situational context. This assumption is called into question, however, by the sizable number of subjects (roughly one third) in experimental research who do not exhibit the predicted framing effect (see e.g., Kahneman, Knetsch, and Thaler 1991; Quattrone and Tversky 1988). That these subjects have been ignored is unproblematic in a field such as economics, which ordinarily concerns itself with the modal behavior of utility maximizers in markets (Kowert and Hermann, 1997). Yet for students of international politics, such an oversight is particularly troubling when the behavior of a single leader and/or a group of decision makers often has dramatic policy consequences (ibid.).

At the individual level, it is clear that personal characteristics such as personality, age, race, gender, education, income, and profession may all have an impact on risk attitude (Levy 1992b). Kowert and Hermann (1997) conducted experiments to test whether personalities affect the pattern of risk taking. Contrary to prospect theory, experimental results found that some people were especially willing to take risks to make gains, whereas others were particularly unlikely to take risks when facing potential

losses. In other words, differences in individual personalities contribute to different risk taking propensities.

If we are certain that individual differences matters in risk taking behavior, then, it is rather legitimate to infer that differences at aggregated levels above individuals, e.g., social and cultural groups, may necessarily contribute to difference risking taking propensities as well. As a matter fact, for the sake of generalizability in theory building, it is even more important to focus on the group level than the individual level. Levy (1992b) rightly points out that an analysis of the role of risk propensities in international relations should not be confined to framing around a reference point but should be expanded to include other variables as well such as culture. He (ibid.) notices that nearly all experimental work on framing, the reflection effect, and loss aversion has been conducted on American subjects. He calls for examining whether observed tendencies are as prominent in other cultures. In fact, in social psychology and management science literature, comparative study of risk taking behavior between cultures have already drawn wide attentions (see e.g., Weber and Hsee 1998; Bontempo et al. 1997; Weber et al. 1998; Choi and Nisbett 2000; Choi et al. 2003; Weber and Milliman 1997; Wright and Phillips 1980).

Beyond the Rational – Cognitive Debate

The rational choice vs. prospect theory debate reflects one of the broader debates in the scholarship of decision making, i.e., the debate between rational choice school and cognitive school.

The rational choice school and the cognitive school are two major distinct approaches to the study of decision making. The rational choice school is often viewed as *choice outcome* school, as it focuses on the accuracy of the prediction of their models about actual choice outcomes; the cognitive school, in contrast, emphasizes the cognitive processes of choice making and therefore is often viewed as *choice process* school. Rational choice theorists usually start with a set of prior assumptions (such as rationality, utility maximizing, holistic information searching, and etc.), rely on deductive reasoning and logic consistence, and attempt to build up models which have a strong power in predicting choice outcomes. The major strength of this approach lies in its "outcome validity" (Mintz 1997, 7). Cognitive theorists, in contrast, are typically interested in studying how decision makers acquire and process information and what cognitive factors actually affect information processing and final choices. The main strength of cognitive theories and models lies in its "process validity" (Mintz 1997, 6).

In terms of the major weaknesses of each school, rational choice theories have been criticized for paying little attention to cognitive variables and explaining almost nothing about process (see Mintz 1997), while cognitive approaches have been blamed for offering no axiomatic bases and having less ability to predict choice outcomes than rational choice models (see Morrow 1997).

For some scholars, however, studies on decision processes and outcomes do not necessarily have to be separated. Poliheuristic theory of decision making presents an attempt to incorporate some rational choice premises into the cognitive model of decision making, thus combining the comparative advantages of rational choice and

cognitive approaches and achieving both descriptive accuracy and predictive validity (Mintz 2004a; Mintz and Geva 1997; Mintz et al. 1997).

Poliheuristic theory posits that policy makers employ a two-stage decision process consisting of "…. (a) rejecting alternatives that are unacceptable to the policy maker on a critical dimension or dimensions and (b) selecting an alternative from the subset of remaining alternative while maximizing benefits and minimizing risks." (Mintz 2004a, 6-7).

Poliheuristic theory also sees domestic political costs as an integral part of foreign policy decision making (Mintz 2004a). Policy makers often employ the noncompensatory strategy to avoid major political loss. Alternatives that incur potentially very high political costs are likely to be rejected during the first stage of the decision process even if they may carry high benefits on other dimensions (ibid., 7).

The merits of poliheuristic theory prompted scholars to apply the theory to explain and predict a variety of decisions in international relations. Those include decisions on the use of the nonuse of force, crisis initiation, crisis escalation, crisis termination, framing, learning, negotiation, peace, rivalry termination, and conflict resolution.[4]

Conclusion

Prospect theory was developed by Kahneman and Tversky (1979) in order to integrate these observed patterns of behavior into an alternative theory of choice under

[4] For collections of studies utilizing poliheuristic theory in international relations, see the 2004 February Journal of Conflict Resolution special issue on poliheuristic theory and the edited volume by Alex Mintz (2003).

risk. The theory has been applied in various studies of international relations and foreign policy behavior (see e.g., Farnham 1992; Jervis 1988, 1989, 1991, 1992; McDermott 1992, 1998).

In the next chapter, I will review the contributions of prospect theory to international politics. In particular, I will focus on the effects of gains vs. losses domains on risk taking behavior in foreign policy decision making.

CHAPTER III

APPLICATION OF PROSPECT THEORY IN INTERNATIONAL RELATIONS: THE EFFECTS OF GAINS VS. LOSSES

Introduction

Prospect theory predicts that gains vs. losses domains affect risk propensity. People tend to be risk averse in the domain of gains and risk seeking in the domain of losses. This is the crux of prospect theory (McDermott 1998). In its application to international relations, most research utilizes prospect theory to explain risk taking behavior as a function of gain vs. loss domains (see e.g. McDermott 1992, 1998; Berejikian 1997; Levi and Whyte 1997; Nincic 1997; Weyland 1996).

In this chapter, I first review the extant literature in international relations applying prospect theory. In particular, I will focus on works based on the theoretical premise that risk propensities are affected by gains vs. losses domains.

Gains vs. Losses

One of the central benefits of invoking psychological theories for understanding political events is the superior descriptive power that psychological theories offer. As with prospect theory, its heuristic and explanatory value prompted researchers to apply the theory to foreign policy decision making (e.g., see the 1992 special issue of *Political Psychology*). Among the important insights provided by prospect theory, framing effect has been the most frequently utilized by political scientists to address issues in world politics.

As suggested by Levy (1992b, 283), prospect theory has "enormous potential for explaining a wide range of international behavior and … a number of its hypotheses appear to provide reasonable explanations for observed behavior." He described several decision making tendencies evident in international politics that are consistent with the implications of prospect theory among which the tendency related to the framing effects (the tendency for leaders to be risk averse in the domain of gains but risk accepting in the domain of losses) is the most prominent one. Mintz and Redd (2003) systematically examined the concept of framing and highlighted the framing effects in U.S. foreign policy. The authors show that various framing techniques and strategies allow leaders, advisors and the media to frame actors, actions and, policies to the public in many ways. On the other hand, different frames also affect policy choices made by leaders. For example, Taylor-Robinson and Redd (2003) analyzed the case of the U.S.-led coup in Guatemala in 1950s and concluded that the way that the United Fruit Company framed the new Guatemalan government – a communist regime – basically convinced and, to a certain extent, forced U.S. President Eisenhower to act.

Jervis (1991, 1992) also emphasized the heuristic value of prospect theory for understanding and investigating foreign policy decisions. As a descriptive model of risky choice, prospect theory can suggest coherent interpretations of decisions that would be difficult to explain on the basis of the traditional expected utility/rational actor framework.

Prospect theory and the descriptive findings upon which is based generate a rich set of hypotheses about international behavior. According to Levy (1997b), some of the

major hypotheses include: (1) State leaders take more risks to maintain their international positions, reputations, and domestic political support than they do to enhance/regain/maintain those positions. (2) After suffering losses (in territory, reputation, domestic political support, etc.), political leaders have a tendency not to accommodate to those losses but instead to take excessive risks to recover them (where "excessive" is defined with respect to predictions based on expected value). (3) Because accommodation to losses tends to be slow, sunk costs frequently influence decision makers' calculations and state behavior.

Several prospect-theory-based case studies have been conducted to examine a few crucial foreign policy decisions by U.S. presidents as affected by the gain vs. loss domains in which they were situated. Those cases include Roosevelt's handling of the Munich crisis (Farnham 1992) and Kennedy's actions during the Cuban missile crisis (Whyte and Levi, 1994). More recently, in her book on risk taking in American foreign policy, McDermott (1998) analyzed four decisions made by President Eisenhower and Carter.

In McDermott's book, Carter offered two almost paradigmatic cases. The first case is the failed rescue mission of the hostages in Iran in 1980, which was clearly a decision taken in the domain of loss according to the author. The mission itself appears to offer an almost classic example of a gamble with a high chance of failure and a low probability of success taken in the hope of recouping even larger losses. The second case involves Carter's decisions surrounding the admittance of the Iranian Shah, Mohammad Reza Pahlavi. According to McDermott (ibid.), in a relative domain of

gains after his success at Camp David in brokering peace between the Israelis and the Egyptians, Jimmy Carter blocked the Shah'e entry into the United States after the Iranian revolution of early 1979. As the Shah's health worsened, and as Carter himself came under increasing criticism from the domestic right for his stance on SALT II and his treatment of the Shah, Carter eventually relented in October 1979 and let the Shah into the country. In early November, the American hostages were seized and held captive at their embassy in Tehran by militant student supporters of Ayatollah Khomeini. This event threw Carter into a new domain of loss, prompting him to plan for the highly risky, and ultimately failed, hostage rescue mission of April 1980 (McDermott 1998).

The Soviet downing of the U-2 spy plane incident placed President Eisenhower in a domain of loss (McDermott 1998). In this state, he took a risk and publicly lied about the origins and purpose of the aircraft. Severe recriminations, including the canceling of a carefully crafted summit conference, followed in the wake of the revelation that he had lied. In the Suez crisis, however, Eisenhower behaved cautiously while in a domain of gains (ibid.). In this case, as discussed by McDermott (ibid.), Eisenhower took a sure gain in public opinion in the Third World over a risky gamble, which offered the possibility of strengthening the Western alliance and intimidating potential aggressors, but also risked instigating a world war with the Soviet Union.

In examining economic policies adopted by a number of countries in Latin America, Weyland (1996) utilized prospect theory to address the following puzzles: (1) Under what conditions do governments enact socially painful and politically dangerous economic plans? (2) Why do some administrations prefer caution whereas others make

surprisingly risky choices? (3) And why do measures that are equally tough encounter popular support in some countries while arousing widespread rejection in others? Specifically, the author introduced prospect theory to the study of comparative politics in order to account for the bold economic policy choices that presidents made in crisis-ridden Argentina, Brazil, and Peru, and the surprising degree of popular support that such risky and costly measure commanded in these countries; and conversely, to explain the cautious course of reform recently pursued in Chile, a country with better economic prospects. As noticed by Weyland (ibid.), theories based on rational choice, the leading approach to political decision making, did not anticipate these decisions. Particularly, these theories predicted that fear for their political survival would prevent democratic leaders from enacting tough economic policies. Prospect theory, under these circumstances, served as a useful alternative to extant rational choice explanations in elucidating decision making during crises.

Berejekian (1997) deployed prospect theory in an attempt to synthesize the neorealist and neoliberal debate. He demonstrated that states in a gains frame pursue absolute gains and are risk averse, while states in a losses frame pursue relative gains and are risk acceptant. He tested this hypothesis against the behavior of the European Community in the formation of the Montreal Protocol, a regime intended to protect the earth's protective ozone shield. His model, while incorporating prospect theory, accurately predicted the timing and content of shifts in EC preferences, further suggesting that a synthesis of realist and liberal approaches is possible.

As noted by Levi and Whyte (1997), most of the above mentioned case studies employed similar methodological approach by applying historiographical methods (Goodman and Kruger 1988) to demonstrate the consistency of the decision with prospect theory. Through close examinations on historical documents, researchers first attempted to identify the reference point adopted by key decision makers and the decision framing induced by the reference point. They subsequently examined the level of riskiness of the decision makers' chosen action as related to the previous framing (Levi and Whyte 1997).

Yet, case study approach is not the only methodological venue through which scholars utilize prospect theory to explain foreign policy behavior. Levi and Whyte (1997) studied risky group decision-making in Japan from a prospect theory perspective. Through content analysis of the transcripts of Japanese leaders' deliberations prior to their 1941 decision for war and subsequent attack on Pearl Harbor, the authors tested hypotheses concerning the effects of the reference point on risk preferences in group decision making. Their results were consistent with the prospect theory. Nincic (1997) employed multiple regression technique to explore whether the manner in which the issue was framed would affect the level of support that the American public and Congress offered for military intervention. In consistent with prospect theory, a military intervention would receive higher percentage of public and congressional approval if it were framed as to avert a loss than to secure a gain.

Experimental methods have also been used to test the applications of prospect theory in international relations. For example, Mintz and Geva (1998) applied prospect

theory and the non-compensatory principle of decision-making to the study of war termination. Experimental results showed that, as with decisions to start a war, the domain in which a leader operates (gains vs. losses) also affects the decision to terminate a war. Specifically, decision-makers who operate in the domain of gains (when their popularity is on the rise) are more likely to terminate the use of force – a relatively riskier option – than when they operate in the domain of loss (when their popularity decreases). Boettcher (1995) examined verbal probability assessments as affected by gain and loss framings in foreign policy decision making contexts.

In international relations, status quo may be perceived as functioning in either the domain of gains or the domain of losses. Numerous instances show that a state that perceives itself to be in a deteriorating situation (domain of losses) might be willing to take excessively risky actions in order to maintain the status quo against further deterioration (Levy 1992b). Loss aversion and risk-seeking also help explain why states frequently find themselves continuing to follow failing policies far longer than a standard cost-benefit calculus might predict (Jervis 1992). For example, in warfare, they might strive to redeem or reverse the losses they have experienced, causing them to fight longer than any estimate of likely net gains would lead one to expect. That offers at least partial explanations for the US and Soviet Union's prolonged and unsuccessful involvements in Vietnam and Afghanistan respectively.

Conclusion

Based on the discussion above, prospect theory contributes significantly to the understanding of risk taking behavior in foreign policy decision making. One of its major insights, i.e., decision makers tend to be risk averse in the domain of gains and risk seeking in the domain of losses, has been widely utilized to explain foreign policy decision making under risk (see e.g., Farnham 1992; McDermott 1992, 1998; Weyland 1996; Levi and Whyte 1997; Mintz and Geva 1998, etc.).

However, the weaknesses of prospect theory has also been widely acknowledged and discussed (see e.g., Levy 1992a, 1992b, 1997a, 1997b; McDermott 1998). In chapter II, I have discussed the two major criticisms of prospect theory. One refers to the fact that prospect theory is an incomplete theory of decision making since it neglects the significance of decision making process (Levy 1992a, 1992b, 1997b). The other criticism points out that prospect theory is over-deterministic in assuming that the risk orientation of decision makers is determined primarily by the framing of losses or gains around reference point. Other important variables that may also influence risk attitudes, such as culture, are largely ignored.

In this dissertation, with an intention to remedy the above-mentioned two criticisms, I have two goals in mind. First, I seek to extend prospect theory by attempting to determine how gains vs. losses domains may affect the selection of strategies utilized in decision making process. Second, to enrich our understanding of comparative risk taking behavior in foreign policy decision making, I borrow literature from cross-cultural psychology research and intend to explain the dissimilarities between

decision makers from different ethnic/cultural backgrounds from a cultural perspective. To do so, I first, in the following chapter, develop and extend prospect theory in order to account for the impact of gains vs. losses domains on decision strategies.

CHAPTER IV

EXTENDING PROSPECT THEORY TO EXPLAIN DECISION PROCESS IN FOREIGN POLICY DECISION MAKING

Introduction

Any decision consists of two main components, process and choice (Redd 2000). Decision makers engage in a process of acquiring and integrating information, which then enables them to make a choice. As Carroll and Johnson (1990, 19) state, "decision making is a process by which a person, group, or organization identifies a choice or judgment to be made, *gathers and evaluates information about alternatives, and selects from among the alternatives*" (italics added).

Students of decision making are often concerned either with choice or processes. Choice refers to *what* the decision maker chooses among available alternatives, whereas process is about *how* choices are made. As noted by Abelson and Levi (1985, 232), the former focuses on the relationship between stimulus and response or between input and output, i.e., on the *structure* of sets of choices made under specified conditions. The latter, on the other hand, emphasizes on the transformation process that occurs between the stimulus and response (ibid.).

Theories based on outcomes attempt to make predictions about choice based on past behavior in a linear fashion. Process models, in contrast, acknowledge that while we may be able to predict choice based on previous actions, we still don't know why decision makers are behaving in a particular manner. Furthermore, the method of using past behavior to explain and predict decision making choices assumes consistency of

behavior over time. It is, therefore, weak in explaining behavioral anomalies. Process models, instead, delve deeper into the decision-making process in order to determine how the decision environment influences decision processes and, in turn, how process affects choice. Even when linear models may nicely predict decision outcome, it may be due more to the features of the task and to the insensitivity of the models than to the properties of decision maker (Dawes 1975, 1979; cf. Simon 1976). In some cases, algebraically equivalent models of choice may in fact suggest very different underlying processes (Graesser and Anderson 1974; Green 1968; Hoffman 1960).

As Carroll and Johnson (1990, 71) note, using a linear outcome-based model is "like trying to figure out the workings of a watch from its output." If we merely need to know the time then we probably won't care what's inside the watch. However, if we want to know how the mechanisms work inside a watch in order to improve the performance of the watch, then, we must dig deeper and ask "how" and "why." Processes models are intended for us to ask how and why decisions are so made. Process models are particularly useful in identifying individuals' decision strategies during judgment or choice tasks.

As discussed in last chapter, prospect theory is considered an incomplete theory of decision making under risk (Levy 1997b). Prospect theory at its current stage only focuses on explaining and predicting choices. To develop into a full-fledged theory of decision making, prospect theory must include decision processes. In the current and following chapters, I intend to embark such an effort. Specifically, in this chapter, I look at how gains vs. losses domains may affect decision processes in foreign policy decision

making. First, I will briefly discuss the literature pertaining to decision making strategies in foreign policy decision making. Second, I will examine the effects of gains vs. losses domains on the selections of various decision strategies during a decision making process. Third, I summarize those effects by presenting empirically testable hypotheses.

Decision Making Strategies and Rules

In any given decision task, decision makers process information en route to a choice. Researchers, attempting to identify and categorize these processes, have identified various decision rules and strategies most commonly used by decision makers (see e.g., Abelson and Levi 1985; Ford et al. 1989; Hogarth 1987; Olshavsky 1979; Payne, Bettman, and Johnson 1988, 1993; Svenson 1979). According to Payne, Bettman, and Johnson (1993, 9), a decision strategy is a "sequence of mental and effector (actions on the environment) operations used to transform an initial state of knowledge into a final goal state of knowledge where the decision maker views the problem as solved." A decision maker very often needs to obtain information from various sources so as to make a diagnostic judgment on a certain decision task. During this operation, various decision strategies may be employed to make sense of the existing information in order to facilitate the judging process.[5]

[5] Quite often, the terms "decision rules" and "decision strategy" are used interchangeably. Beach and Mitchell (1978, 439 – 40) make a slight distinction by stating that a decision strategy consists of a set of procedures "that the decision maker engages in when attempting to select among alternative courses of action." A decision rule "dictates how the results of the engaged-in procedures will be used to make the actual decision" (ibid.). Actually, the distinction is not significant enough to warrant separating the two and since most scholars mutually substitute the terms decision rule with decision strategy, the two will be used interchangeably throughout the rest of this study. Sage (1990, 232) notes that the purpose of decision

Five main processing characteristics/strategies are relevant to foreign policy decision making: (1) holistic vs. non-holistic search, (2) dimension vs. alternative-based processing, (3) compensatory vs. non-compensatory decision rules, (4) satisficing vs. maximizing behavior, and (5) order-sensitive search (see Mintz and Geva 1997; Mintz et al. 1997; Redd 2000, 52). This study focuses on examining the effects of gains vs. losses domains on four types of processing characteristics/strategies. Those are holistic vs. non-holistic search, dimension vs. alternative-based processing, compensatory vs. noncompensatory decision rules, and satisficing vs. maximizing behavior.[6]

Holistic vs. Non-holistic Search

Holistic information processing strategy is line with rational choice approach to decision making. It is very cognitively demanding. Holistic search implies that the selection of an alternative is usually based upon the detailed, conscious consideration of all aspects of the alternatives (Mintz and Geva 1997, 84). In order to select an alternative that maximizes utility, decision makers are often engaging in an exhaustive comparison process, evaluating and comparing all alternatives across different dimensions (Mintz 1993). Expected utility theory, subjective expected utility theory, and multi-attribute utility theory all suggest holistic processing as the decision rule employed by decision makers.

As opposed to holistic processing, other models of foreign policy decision making assume that actually decision making behavior is boundedly rational at best (see

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rules is to "specify the most preferred alternatives; generally from a partial or total ordering, or a prioritization of alternatives."

[6] The following sections are based on Simon (1945) and Mintz and Geva (1997).

e.g., Simon 1945; Mintz and Geva 1997). Decision makers often employ heuristics as cognitive tools to facilitate and shorten the decision making process. Heuristics compensate for incomplete information as they provide cognitive shortcuts to intricate foreign policy matters by organizing the information so as to facilitate the decision process (Sniderman, Brody, and Tetlock 1991, 19). For example, the poliheuristic theory of foreign policy decision making posits that when decision makers compare policy options they do so within a very limited choice set. Environmental and individual cognitive constraints often make a complete examination of all alternatives across all dimensions impossible. Heuristics are thus introduced as cognitive shortcuts that allow decision makers to efficiently adopt or eliminate options. As Mintz and Geva (1997, 84) state, "Holistic decisionmaking is cognitively demanding, while non-holistic, heuristic-based models are typically streamlined by rules that offer cognitive shortcuts. The selection of an alternative is not based upon the detailed, conscious consideration of all aspects of the alternatives" (see also Mintz 1993). According to the poliheuristic model, comparisons of policy options are made within a very restrictive alternative set and attribute set (Mintz and Geva 1997, 84). Non-holistic models employ a simplified process whereby the decision maker sequentially eliminates or adopts alternatives "by comparing them to each other, or against a standard, either across dimensions or across alternatives" (Sage 1990, 233). Foreign policy decisions are often grounded in the rejection or adoption of alternatives on the basis of one or at most a few dimensions.

Dimension vs. Alternative-based Processing

Dimension vs. alternative based strategies have been identified as two "pure" modes of information processing (see Ford et al. 1989; Payne, Bettman, and Johnson 1988, 1993). In the former case all alternatives are compared on a single dimension, then on another. In the latter case each alternative in the choice set is processed and evaluated as a whole, and then a choice is made on the basis of these evaluations.

Dimension-based strategy is also called the *intradimensional* strategy. It implies that, given a decision matrix that contains alternatives and their implications across different dimensions (e.g., political, economic, military, and etc.), decision makers will firstly focus on a given dimension and then review all information within that dimension across alternatives, and then, decision makers will proceed to another dimension, repeating the same process as the first one (Payne 1976). Alternative-based strategy, on the other hand, is also termed the *interdimensional* strategy. As opposed to dimension-based strategy, decision makers will review all information within a given alternative across all dimensions and then proceeds for any other alternatives in the same fashion. Riggle and Johnson (1996) suggest these two information acquisition strategies represent two poles along an information-processing continuum (see also Mintz et al. 1997; Redd 2000).

Since expected utility models suggest that decision makers select an alternative with the highest value of overall utility that is the sum of all values of utilities of the chosen alternative across all dimensions, then, alternative-based search is implied to be taken by the decision makers. Others have argued that the choice of either dimension-

based or alternative-based strategy is a function of decision making task complexity (see e.g., Olshavsky 1979; Payne, Bettman, and Johnson 1988, 1993; Mintz et al. 1997, etc.). Russo and Dosher (1983) posit that dimension-based (intradimensional) processing strategy is cognitively easier and hence more likely to be employed in cognitively demanding conditions (see also Redd 2000).

As opposed to expected utility models, the poliheuristic theory of foreign policy decision making implies a dimension-based information processing pattern rather than alternative-based search (Mintz and Geva 1997, 85). A dimension can be conceived as an organizing them (OT) for related information as well as variables (Ostrom et al. 1980). In foreign policy decision making, the decision maker is often concerned with the impact of alternatives on a certain dimension(s), for example, domestic politics. Then, the decision maker is more likely to use that dimension as the benchmark to evaluate the utilities of alternatives. Alternatives may be adopted or rejected on the basis of their utility within a certain dimension. Thus, the information processing strategy has to be dimension-based. The decision maker starts by evaluating all alternatives across the first, and often, the most crucial dimension. She then proceeds to the second dimension, evaluating all surviving alternatives from the first round.

Compensatory vs. Non-compensatory Strategy

Compensatory strategy requires commensurability, meaning that values on different attributes/dimensions can be traded off against each other (Abelson and Levi 1985; Payne, Bettman, and Johnson 1993). High values on one attribute/dimension can compensate for low values on another dimension (Abelson and Levi 1985; Payne,

Bettman, and Johnson 1988, 1993; Billings and Scherer 1988; Ford et al. 1989; Hogarth 1987). Abelson and Levi (1985, 260) present an example of utilizing compensatory strategy in choosing an automobile in which a decision maker may sacrifice some economy (mpg) for an increase in safety in selecting automobile C over B, or may simply accept an automobile that is unattractive on either safety or economy, yet, whose price is sufficiently low (automobile A).

Compensatory strategy generally requires an interdimensional form of processing in which the decision maker assigns an overall utility rating to each alternative in the choice set (Abelson and Levi 1985). The overall utility score can be generally calculated by two methods, the addition-of-utilities method (Abelson and Levi 1985, 261) and the additive difference method (Redd 2000). The addition-of-utilities method requires that the decision maker sums all the utilities for each alternative and then chooses the alternative with the greatest sum. The additive difference method requires that utility scores of alternatives are compared in each dimension, and these differences in utility scores are summed across all the dimensions (Redd 2000). The sum of the dimensional differences results in a preference for one alternative (Ford et al. 1989; Hogarth 1987; Olshavsky 1979; Sage 1990; Redd 2000).

Non-compensatory strategy does not allow trade-offs between alternatives. Several methods qualify as non-compensatory strategy: conjunctive rule, disjunctive rule, lexicographic rule, and elimination by aspects (EBA) rule (Abelson and Levi 1985; Ford et al. 1989; Hogarth 1987; Olshavsky 1979; Payne 1976; Sage 1990; Tversky 1972). A conjunction rule assumes that the decision maker chooses minimum cutoffs for each

dimension (Abelson and Levi 1985). If a given alternative does not exceed all of the dimension cutoffs, it is then rejected. When more than one alternative exceeds the cutoffs on all dimensions, the conjunctive rule will then yield more than one acceptable alternative (ibid.). The decision maker may then continue by making the cutoffs stricter and applying the conjunctive rule again, or by simply employing a different decision rule that would yield a single alternative. As noted by Abelson and Levi (1985), however, the decision maker may not necessarily proceed to the second phase if an acceptable (satisficing) alternative is identified from the first step.

The disconjunctive rule requires the establishment of cutoffs on each dimension. It differs from conjunctive rule in that an alternative is acceptable when it has at lease one value greater than the corresponding cutoff, whereas for the latter, an acceptable alternative must exceed all of the dimension cutoffs (ibid.). Yet these two rules share a common characteristic that neither of them stipulates any ranking or weighting of attribute dimensions by the decision maker.

In contrast, lexicographic rule and elimination-by-aspect rule both require assigning weighting or rank ordering to attribute dimensions in terms of level of significance (Abelson and Levi 1985; Ford et al. 1989; Hogarth 1987; Payne 1976). Lexicographic rule implies an intradimensional form of processing in which alternatives are evaluated against rank-ordered attribute dimension sequentially. Hogarth (1987) is concerned with possibly inconsistent nature of the decision choice produced by lexicographic rule. He argues that the order in which alternatives appear may mediate the effect of the true preference of the decision maker (ibid., see also Redd 2000).

Tversky (1969) also points out that noncompensatory rules such as the lexicographic or elimination-by-aspects rules can lead to intransitivities (see also Abelson and Levi 1985).

The elimination-by-aspects rule (EBA), proposed by Tversky (1972), states that the decision maker firstly evaluate alternatives against the threshold value of the most highly weighted attribute dimension and those do not meet the criteria will be deserted. Then, the decision maker repeats the same procedure for the remaining alternatives until only one alternative remains (ibid., see also Abelson and Levi 1985). The form of processing, as implied by the elimination-by-aspects rule, is intradimensional.

The poliheuristic theory of foreign policy decision making suggests that foreign policy decisions are typically based on a noncompensatory strategy. As Mintz and Geva (1997, 85) state, "…. [I]f a certain alternative is unacceptable in a given dimension (e.g., it is unacceptable politically), then a high score in another dimension (e.g., the military balance of forces) *cannot* compensate for or counteract it, and hence the alternative is eliminated." (Italics in original) In contrast to expected utility model, the poliheuristic model is nonadditive. An alternative can be eliminated if its score on a critical dimension is below the cutoff threshold. Thus, the decision maker may reject or accept an alternative on the basis of one or a few dimensions rather than to evaluate an alternative along all other dimensions (Mintz and Geva 1997).

According to Mintz (1993), political leaders almost by definition take into account, either explicitly or implicitly, political factors and consequences while making policy decisions. In his study of the first Gulf War, Mintz (1993) demonstrated, through historical documents and written accounts, that President Bush's decision to attack Iraq

followed the noncompensatory principle in the decision making process and that the political dimension is the most salient dimension in Bush's calculus. Furthermore, "in a choice situation, if a certain alternative is unacceptable on a given dimension (e.g., it is unacceptable politically), then a high score on another dimension (e.g., the military) *cannot* compensate/counteract for it, and hence the alternative is eliminated" (italics in original) (see also Mintz and Geva 1997).

Maximizing vs. Satisficing Strategy

Expected utility model implies that after a holistic, interdimensional, and compensatory search, the decision maker will apply additive rule to select an alternative that has the maximal utility. Models characterized by intradimensional processing (e.g., the lexicographic or elimination-by-aspects rules) and screening processing (e.g., the conjunctive rule), on the other hand, can lead to suboptimal choices (Abelson and Levi 1985).

Simon (1945), when discussing bounded rational model of decision making, introduced the notion of satisficing. Simon (ibid.) contends that the bounds of our rationality include limitations on our knowledge of the consequences of the actions we consider, our ignorance regarding what value we will ultimately attach to those consequences we foresee, and our capacity to take into account only some of the alternatives available in any choice situation. To provide a more plausible standard, Simon proposes a satisficing theory of rationality. Simon's theory is distinguished by its satisficing rule of rational choice, a rule that by design reduces the informational and computational requirements of rational choice. The intuitive motivation for a satisficing

rule is straightforward: if the rationality of "economic man" is not feasible for us, and if we wish to have some explicit standard of rationality that is feasible for us, then we need an account of limited bounded rationality. Simon's satisficing rule requires an agent first to identify the set of all satisfactory outcomes in a choice situation, and then to choose an alternative all of whose outcomes are in the set of satisfactory outcomes (Simon 1955). In other words, it is rational to choose any action that guarantees a satisfactory outcome.

For Simon, satisficing is the best we can do in the direction of optimizing due to our bounded rationality: "If computational powers were unlimited, a person would simply consult his or her preferences (utility functions) and choose the course of action that would yield the maximum utility under the given circumstances…. But real human beings, of bounded rationality, cannot follow this procedure. Faced with complexity and uncertainty, lacking the wits to optimize, they must be content to satisfice." (Simon 1979, 3)

In the same vein, when comparing the two methods of public policy making, the rational-comprehensive method and the successive limited comparison method, Lindblom (1959) points out that ideal model of rationality often is limited by the costliness of analysis, political environment, and constraints of given situation, and etc. Therefore, instead of making a one-shot, maximizing decision, it is preferred that policy makers will take a step-by-step and incremental approach. Policy change should take place in small steps.

The poliheuristic model of foreign policy decision making represents a decision making process in which alternatives are not rejected or adopted on the basis of a maximizing rule. Instead, it can be categorized as satisficing since it is concerned with finding "acceptable" alternatives and it employs some form of elimination by dimensions (Mintz and Geva 1997, 86). Moreover, decision makers may not necessarily consider all dimensions before a decision is made (Mintz and Geva 1997, 86).

Order-Sensitive Search

One of the central premises of many decision making theories, such as the analytic/rational and compensatory models, is the invariance assumption. The invariance assumption posits that "preference order among prospects should not depend on how their outcomes and probabilities are described and thus that two alternative formulations of the same problem should yield the same choice" (Quattrone and Tversky 1988, 727). The invariance assumption implies that regardless of the way a decision task is framed with respect to the ordering and sequencing of dimensions and alternatives, the outcome should remain the same.

The poliheuristic theory states that, in reality, the invariance assumption is violated frequently by the different ways that the alternatives are framed (Mintz and Redd 2003; Geva and Mintz 1994; Geva, Astorino-Courtois, and Mintz 1996; Kahneman and Tversky 1984; Taylor-Robinson and Redd 2003). Moreover, according to the poliheuristic theory, alternatives and dimensions can also be presented in different orders or sequences to decisionmakers (Mintz and Geva 1997, 87). In fact, in a dimension-

based decision making process, the choice of a particular alternative may depend on the order in which particular dimensions are invoked (ibid.).

In an experimental setting, Mintz et al. (1997) found that the invariance assumption was violated when they tested for the effects of the dynamic presentation of alternatives. One experimental group was faced with a 'static' choice set where all the alternatives and dimensions were present from the beginning of the decision task. On the other hand, the other group faced with a 'dynamic' choice set was initially faced with only three of the alternatives and then the fourth alternative appeared after a certain amount of information had already been accessed. The authors found that changes in the presentation of the choice affected how decision makers processed the available information and ultimately which alternatives were chosen. Moreover, Geva, Redd, and Mintz (2000) also found similar results in an experimental study determining the effects of an added dimension to the choice set. Specifically, they found that the addition of a new dimension during the information acquisition stage caused the decision makers to change not only their decision strategies but also their choices (ibid.).

Effects of Gains vs. Losses

Prospect theory arises as a theory of choice under risk. As noted by Levy (1997b), prospect theory is not a complete theory of decision making. It focuses only on explaining choices. Prospect theory is a theory of the evaluation of prospects but not a theory of the editing of choices (Levy 1992a, 190). Like expected utility theory, prospect theory focuses on behavioral outcomes and excludes the question of how those outcomes are arrived at (Levy 1997, 42). Both expected utility and the evaluation phase

of prospect theory are *structural* theories rather than *process* theories. Given certain parameters of the choice problem, they attempt to explain choices or outcomes, not the processes through which those choices come about (Abelson and Levi 1985, 235). This is an important limitation of prospect theory.

Among the crucial insights of prospect theory is people tend to think in terms of gains and losses. Individuals treat gains and losses differently. In the domain of gains, people are more risk averse, whereas in the domain of losses, people are more risk seeking. Yet, the elaborations of prospect theory on the effect of gains vs. losses domains on decision making are only limited to decision choices. What we can derive from prospect theory is, in the event of an individual perceiving herself to be in the domain of gains, the decision maker is more likely to choose among the alternatives the least risky one. On the other hand, when perceiving herself in a situation of losses, the decision maker is likely to make a riskier choice.

The above elaborations omit the other crucial component of decision making, i.e., decision making processes. If domains, gains vs. losses, may induce different choices, then, a similar effect may be found on decision making processes as well. It is unreasonable to assume a unitary decision making process disregarding the influences of domains. In fact, gains vs. losses domains in which decision makers reside determine, to a large extent, the reference point that the decision makers utilize to evaluate information on alternatives. Difference in reference points will further generate discrepancies in preferences over alternatives and issue dimensions. All those factors may contribute to

the selection of different decision strategies by the decision makers en route to their final choices (see Kanner 2000).

If we agree that gains vs. losses domains may affect the decision strategies decision makers utilize, then, logically, the next question is the question of 'how'. That is, in what manner will gains vs. losses domains influence decision strategies? What strategies are most likely to be employed within the domain of gains? And, in the same vein, what strategies are the mostly likely to be utilized within the domain of losses? To address these questions, I intend to develop and extend prospect theory to account for the impact of gains vs. losses domains on decision strategy selections by the decision makers. As discussed previously in this chapter, this study focuses on the following four main categories of information processing strategies: (1) holistic vs. non-holistic search, (2) alternative vs. dimension-based processing, (3) compensatory vs. noncompensatory decision rules, and (4) maximizing vs. satisficing strategy (see Mintz and Geva 1997; Mintz et al. 1997; Redd 2000, 52). From the perspective of prospect theory, I look into how domains, gains vs. losses, that the decision makers perceive themselves to be within may affect the selection of one information processing strategy over another within each category.

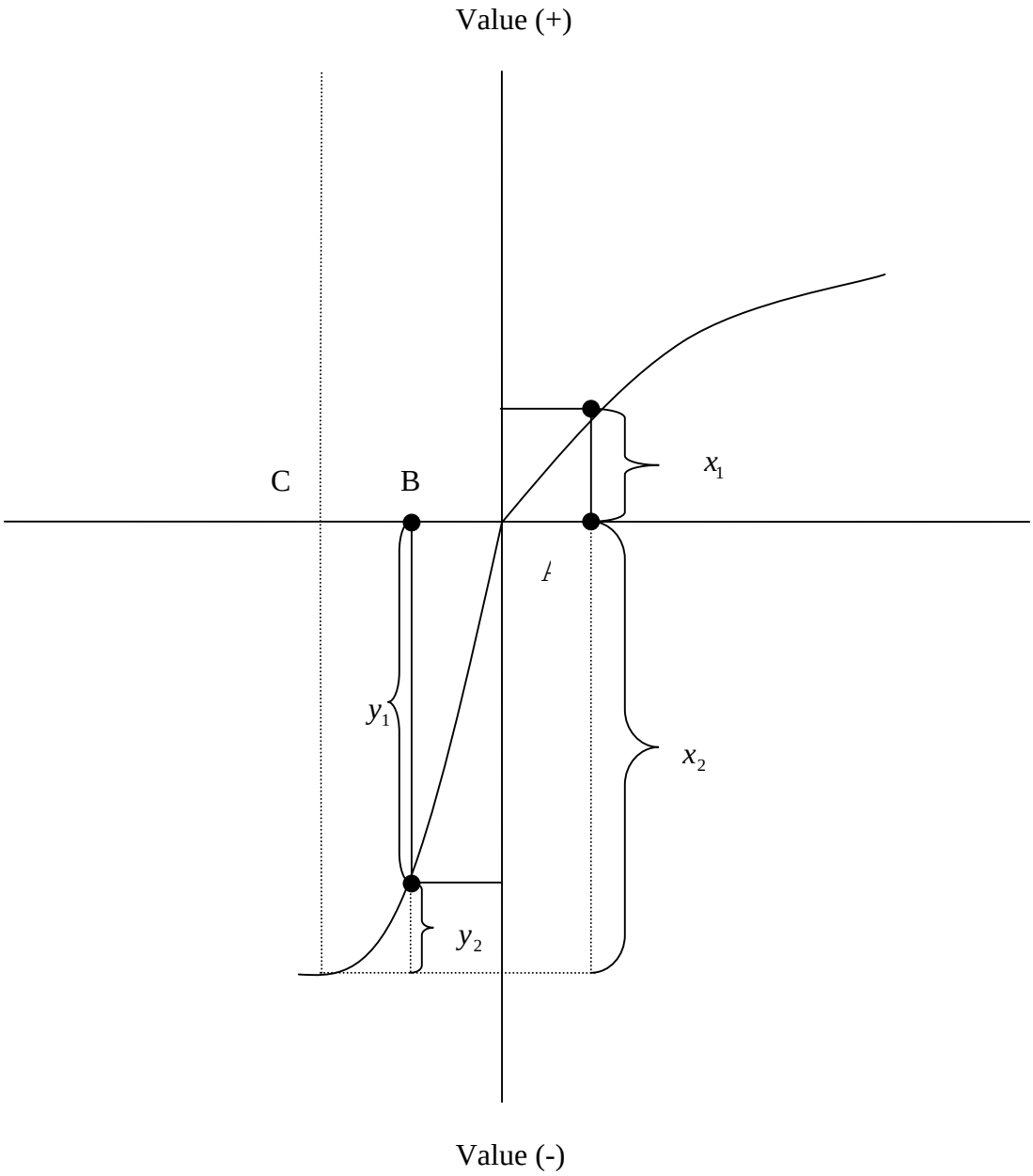
One of the central tenets of prospect theory, the so called 'endowment effect', posits that people overvalue their current possessions (Thaler 1980, 43-47). One consequence of the endowment effect is a tendency toward status quo choices. People treat costs of moving away from the status quo as losses and the benefits of moving away from the stats quo as gains and then overweight the former relative to the latter;

consequently, people stay at the status quo more frequently than expected utility theory would predict.

The endowment effect argument, combing with the risk propensities as affected by the domains, suggests that, given an identical decision task, a decision maker who perceives herself to be within the domain of gains will be more concerned with the impact of the final decision upon her status quo than a decision maker perceiving herself to be within the domain of losses. Relative to her counterpart in the domain of losses, a decision maker in the domain of gains is much more reluctant to lose her current advantageous possessions. For the decision maker in the domain of losses, the prospective negative impact of the final decision upon her status quo is not considered as crucial as in the eyes of the decision maker in the domain of gains. The potential losses will only make her current *failure* more aggravating. Therefore, it is logical to assume that, given an identical decision making task, a decision maker in the domain of gains will be more *cautious* than a decision maker in the domain of losses. The reason, based on prospect theory, is that a decision maker in the domain of gains will overvalue the potential negative impact of the decision she will make much more than her counterpart in the domain of losses.

The above argument can be easily applied to decision making in international politics. Figure 4-1 represents an example of hypothetical value functions for two states A and B. The two states share the same reference point, the minimum conditions required for staying in power. They differ in their respective status quo, however. State A (represented by point A on the horizontal axle) is in the domain of gains with very

Figure 4-1: Hypothetical Value Functions for States in Domain of Gains and Losses



high public approval ratings due to recent successes in domestic and foreign policy. State B (represented by point B on the horizontal axle), as an opposite example of state A, is in the domain of losses. When facing a foreign policy crisis, leaders from both states fear of a policy failure that will change their respective status quo to be thrown out of power (represented by point C on the horizontal axle). As Figure 4-1 shows, in case of policy failure, the loss that will be incurred for State A's leader ($x_1 + x_2$) is greater than that for State B's leader ($y_1 + y_2$). In other words, state A's leader has much more at stake than state B's leader in making a right decision to avoid a failure. As reflected in the process to make a decision, state A's leader is expected to be more *cautious* than state B's leader.

Based on above discussions, I now turn to present two general hypotheses derived regarding the impacts of gains vs. losses domains on decision making processes and choices:

- Impact on Decision Choices

  Hypothesis A: The gains vs. losses domains affect a decision maker's risk-taking propensities.

- Impact on Decision Processes

  Hypothesis B: A decision maker in the domain of gains will be more *cautious* than a decision maker in the domain of losses.

A more specific hypothesis H1 can be naturally derived from Hypothesis A to reflect the effects of the framing of gains vs. losses domains on foreign policy decision choices. This is the central tenet of prospect theory.

> ***H1***: In the domain of gains, the decision maker tends to be *risk averse*; in the domain of losses, the decision maker tends to be *risk acceptant*.

Now I turn to discuss how gains vs. losses domains may specifically affect the decision strategies utilized during decision making process from the perspective of prospect theory. Specifically, I will focus on the effects of gains vs. losses domains on holistic vs. non-holistic search, alternative vs. dimension-based processing, compensatory vs. non-compensatory strategies, and maximizing vs. satisficing strategies and present some specific hypotheses.

Holistic vs. non-holistic Search

As we have addressed earlier, holistic vs. non-holistic information search concern the level of completeness/exhaustiveness exerted by the decision maker. Holistic decision making is cognitively demanding. The selection of an alternative is based upon *detailed* and *conscious* consideration of all aspects of the alternatives. When applying holistic search, an alternative is chosen that maximizes utility on the basis of exhaustive and complete comparison processes. Non-holistic search, on the other hand, requires the employment of heuristics to compensate for the incomplete information, and sometimes, to distill and simply complete information (Sniderman, Brody, and Tetlock 1991, 19; see also, Mintz and Geva 1997, 84). Those heuristics serve as cognitive shortcuts to facilitate and simplify the decision process. Non-holistic search, as opposed to holistic search, often entails less complete and conscious consideration of the information available to the decision maker.

Though identified as two distinctive types of decision strategies, existing decision theories fail to specify under what conditions either type of search, holistic or

non-holistic, is more likely to be utilized by decision makers. Prospect theory, though mostly regarded as a theory of choice, sheds light on resolving the puzzle, as we can infer from Hypothesis B. Hypothesis B posits that, given the same decision making context, a decision maker's information acquisition behavior is likely to be affected by the domain in which she is situated. A decision maker in the domain of gains tends to be more *cautious* in acquiring information than a counterpart in the domain of losses, simply because she has much more to lose had if the final decision turns out to be a mistake. Therefore, logically, given the same amount and types of information, a decision maker in the domain of gains is more likely to conduct a more exhaustive and thorough evaluation of all the information available before opting for a decision than a decision maker in the domain of losses. In other words, a decision maker in the domain of gains is likely to employ a more *holistic* information search than a decision maker in the domain of losses. A hypothesis is therefore derived as:

> ***H2***: A decision maker in the domain of gains is likely to employ a more *holistic* search than a decision maker in the domain of losses.

Alternative vs. Dimension-based Processing

As previously discussed, alternative-based (interdimensional) processing implies a process whereby a decision maker sequentially reviews all items of information within a given alternative across dimensions and then proceeds in the same manner for any subsequent alternatives. In contrast, a dimension-based (intradimensional) processing signifies that an individual focuses on a given dimension and then reviews information within that dimension across alternatives and then continues the process for another dimension (Payne 1976). Russo and Dosher (1983) note that dimension-based

(intradimensional) processing is cognitively easier. Dimension (attribute) often serves as the heuristics to eliminate alternatives without needing to evaluate them in a complete and exhaustive manner.

Again, we can infer from Hypothesis B that how decision makers within different domains (gains vs. losses) may choose between either alternative-based or dimension-based processing. As Hypothesis B suggests, a decision maker in the domain of gains tends to be more *cautious* than a decision maker in the domain of losses in the manner of acquiring and evaluating information before reaching to a decision. Therefore, between the alternative-based search, which is thorough and complete, and the dimension-based search, which is heuristic and short-cut, a decision maker in the domain of gains is more likely to employ the former, comparing with a decision maker in the domain of losses. A hypothesis is therefore derived as:

> ***H3***: A decision maker in the domain of gains is more likely to employ an *alternative-based* search, whereas a decision maker in the domain of losses is more likely to employ a *dimension-based* search.

Compensatory vs. Non-compensatory Strategy

In general, the compensatory principle refers to decision strategies that attempt to make tradeoffs among attributes (Payne, Bettman, and Johnson 1993). In contrast, the non-compensatory principle suggests that "a low score on one dimension *cannot* be compensated for by a high score on another dimension" (italics added) (Ford et al. 1989; see also Billings and Marcus 1983; Billings and Scherer 1988; Hogarth 1987; Payne, Bettman, and Johnson 1988, 1993). In other words, decision makers do not make tradeoffs between high and low scores. Hogarth (1987, 77) states that, psychologically,

tradeoffs are difficult to make because decision makers find them difficult to execute as a result of "information-processing limitations."

Therefore, due to cognitive constraints, decision makers utilize non-compensatory strategy, instead of compensatory strategy, as a shortcut en route to a choice. However, such a pattern of opting for an easier and quicker decision strategy may necessarily be confounded by the willingness to engage in a more cognitively demanding strategy, i.e., a compensatory strategy. As Hypothesis B suggests, a decision maker in the domain of gains may be more *willing* to engage in a cognitively more demanding processing simply because she is much more afraid of committing a mistake.

I then derive the following hypothesis:

> ***H4***: A decision maker in the domain of gains is more likely to employ a *compensatory* decision strategy, whereas a decision maker in the domain of losses is more likely to employ a *non-compensatory* decision strategy.

Maximizing vs. Satisficing Strategy

Satisficing strategy implies that decision makers will "seek a satisfactory solution rather than attempt to search every nook and cranny of the problem space." (Sage 1990, 309) As mentioned previously, Simon (1945) introduced the notion of satisficing in his bounded rational model of decision making. More recently, satisficing implies that decision makers stop searching for information once they have found a satisfactory alternative; moreover, this alternative need not be an optimal one, merely one that satisfies some a prior minimum threshold (Monroe 1991; Zey 1992).

Maximizing strategy is compatible with rational choice models where an alternative is chosen only when it has optimal utilities across all dimensions. Therefore

maximizing strategy is much more cognitively demanding than satisficing strategy. As Hypothesis B implies, a decision maker in the domain of gains is more willing to employ a maximizing strategy than a counterpart in the domain of losses simply because a mistake will be perceived relatively much more devastating by the former.

A corresponding hypothesis is derived as:

> ***H5***: A decision maker in the domain of gains is more likely to employ a *maximizing* decision strategy, whereas a decision maker in the domain of losses is more likely to employ a *satisficing* decision strategy.

Conclusion

Based on the discussions above, the study of decision making process bears significant theoretical and practical importance. A thorough understanding of decision making requires examinations on both choices and processes. Research merely focusing on choices can at best enable us to predict, with certain probabilities, decisions to be made in the future under certain circumstances. That approach leaves out the delineation of the path through which a stimuli leads to a final decision. If we want to investigate into 'how' and 'why' decisions are made, it is crucial to study decision making processes. This approach allows us to look into the anatomy of decision making. Furthermore, investigation into decision making process enables us to make better predictions of future choices. For example, the same decision scenario can induce different choices just by the way that the scenario is framed. Variations in framing affect cognitive processes that lead to the decision. Choice-only approach does not include the component of framing and is therefore unable to explain and predict variances in decisions that are due to framing effect.

Existing literature on decision processes in foreign policy decision making focuses on four types of decision strategies, i.e., holistic vs. non-holistic search, dimension vs. alternative-based processing, compensatory vs. noncompensatory strategy, and satisficing vs. maximizing strategy. Decision making theories differ in their views on what kind of strategies are actually utilized by decision makers.

As Levy (1997b) notes, prospect theory is short of being a complete theory of decision making because it focuses only on choice. However, expositions of prospect theory do shed light on how gains vs. losses domains in which decision makers are situated may affect decision making processes. In this chapter, I extend the theoretical arguments of prospect theory on risk choices in the domains of gains and losses to account for the differences in the four categories of information acquisition strategies. I also derive testable hypotheses.

The hypotheses derived in this chapter focus on decision making behavior at the individual level. Naturally, experimental design serves as the most appropriate method for testing those hypotheses. Before laying out the research design, however, in the next section, I review experimental methodology in the study of international relations. Specifically, I will discuss its contributions to the scholarship and its strengths and weaknesses.

CHAPTER V

EXPERIMENTAL METHODS IN INTERNATIONAL RELATIONS

Introduction

Experiments offer a useful methodological tool to examine issues of importance to political scientists. Works using experimental methods have greatly advanced our understanding of theories and realities in international relations. The main purpose of this dissertation is to examine individual's foreign policy decision making behavior under risk as affected by gains vs. losses domains and cultural differences. The major theoretical tenets this study is based upon are prospect theory and theories of cross-cultural psychology. It is natural, therefore, that I employ experimental method as the methodological venue for testing hypotheses derived in previous chapter.

Before elaborating on the experimental design and procedure I utilize for this dissertation, I devote this chapter to a general discussion and overview of experimental methods in research in international relations. Following a brief review of research utilizing experimental methods in international relations, I discuss some issues of central concern to experimental methods. Advantages and disadvantages of experimentation are summarized.

Experimental Methods in International Relations Research

What do we mean by experiments? According to McDermott (2002a, 2002b), the term refers primarily to laboratory studies in which investigators retain control over the recruitment, assignment to random conditions, treatment, and measurement of subjects. This definition assumes that experimenters strive to assure that the

experimental situation does not vary in any way other than the intended independent variables in order to assure the internal validity (ibid.).

The natural sciences, including biology, chemistry, physics, and medicine, all rely primarily on experimentation to examine and illuminate basic processes. Psychology embodies a long and distinguished history of experimentation, and behavioral economics, which involves a great deal of experimentation, has recently gained increasing prominence within the larger field of economics.

Currently, experimentation is not a major methodology used by political scientists (McDermott 2002a, 2002b). Psychology and behavioral economics share some core assumptions about human nature and experimentation that many political scientists do not: a deep skepticism toward notions of rationality in human behavior; emphasis on experimental validation of modeling assumptions; integration of micro level data; and adoption of the lessons about human cognitive processing, from experimental social and cognitive psychology to models of human behavior (Laibson 2000). Yet, current areas of research in psychology and economics offer promising opportunities to be introduced into political science, including social preferences, investigations of norms, social networks, status and trust, bounded rationality, decision making in complex environments, learning and expectation formation, attitude towards risk, and cognitive biases (ibid.).

In fact, experimental research in psychology and behavioral economics has already greatly contributed to our better understanding of world politics. These contributions are achieved generally through two major venues. Firstly, theoretically,

cognitive social psychology and behavioral economics decision theory, both of which are based on experimental research, serve as basic assumptions for macro-level theories in international politics (Goldeier and Tetlock 2001). New researches in both disciplines are continuously adding on to our understanding of international politics. Secondly, experimentation itself adds to the methodological repertoire of political scientist with its various merits and helps scholars to resolve puzzles that are impeded by the incompetence of other methods.

Many macro-level international relations theorists dismiss psychological arguments, claiming either that they are too reductionist to explain the big patterns we find in world politics or that they are too flimsy or messy to explain anything at all. Most existing theories of international politics appear to rely on minimal assumptions about human cognition and motivation. Structural realists, for example, reject any association with psychology (Waltz 1959, 1979). However, as posited by Goldeier and Tetlock (2001), it turns out that the incorporation of explicit psychological assumption is more advanced in the structural realist framework. This is partly because of the seminal influence of Jervis's work on the source of misperception and partly because misperceptions in the domain of war and peace are so visibly costly to states and their societies, triggering great interest in the failure of some states to play the international power game well (Russett et al. 2000). Another psychological theory, prospect theory, can also allegedly synthesize competing models within the structural realist paradigm (see e.g., Berejekian 1997).

The psychological literature suggests that decision makers are susceptible to dilution effects. They often lose confidence in the diagnosticity of predictively useful cues when those cues are embedded in arrays of utterly nondiagnostic cues (Nisbett et al. 1981; Tetlock and Boettger 1989). From this standpoint, the more unfavorable the signal-to-noise ratio, the greater the risk that decision makers will be distracted by irrelevancies, which may have been intentionally introduced by adversaries to confuse the real issues at stake (Goldeier and Tetlock 2001). These findings may well explain the structural realist argument that errors in statecraft are more likely as the number of great powers increases. Understanding the role of transparency or of domestic/organizational accountability pressure in ameliorating typical errors and biases helps us understand variation in decision making abilities across types of political systems and might shed light on debates such as those regarding the democratic peace.

Moreover, as noticed by Goldgeier and Tetlock (ibid.), work on bounded rationality in competitive markets and mixed-motive games, as well as the literature on the power of human emotions to shape judgments of what represents an equitable allocation of scarce resources or a just resolution of conflicts of interest, can inform neo-institutionalist and constructivist theories. Developments in cross-cultural social psychology shed light on constructivist arguments about the creation and maintenance of international social order that typically rest on the assumption about decision making that are qualitatively different from realist and institutionalist approaches to world politics.

Research in psychology and behavioral economics also prompt political scientists to realize the significance of being able to explain not only *what* decisions are made but also *how* decisions are made. In other words, investigations into decision making processes have gained much attention. Efforts have been made to bridge expected utility models and cognitive theories, with an intention to integrate both decision processes and outcomes. One of the most significant achievements in this regard is the establishment of poliheuristic theory (see e.g., Mintz and Geva 1997; Mintz et al. 1997; Redd 2000; Mintz 2003, 2004a, etc.). The poliheuristic theory highlights the cognitive mechanism that mediates foreign policy choices and behavior. The theory incorporates the conditions surrounding foreign policy decisions as well as the cognitive processes themselves (i.e., the why and how of decision making), thus addressing both the contents and the processes of decisions.

Another contribution that experimentation makes to our understanding of international politics is that of methodological. The introduction of experimental methodology adds to the methodological repertoire of political scientists. It can not only work with other methods perfectly well, such as formal models, to deliver a robust test of theories, but also obtain unique advantages that other methods do not possess, such as the ability to look into decision processes.

In international relations, experimental methods have been used to test the robustness of theories that are built upon state and system level variables. For example, Mintz and Geva (1993) tested for the theory of democratic peace using subjects from different age groups and countries. Experimental results replicate findings using large-N

statistical models. The use of multi-method approach is one of the few ways to ensure robust findings and the reliability of theories (Mintz 2003).

Experimentations also introduce various cutting edge techniques into political science research methodology. These techniques are particularly useful for examining both decision making processes and choices. For example, one technique that is unique in its ability to identify and trace processes of decision making is computerized process tracing, a research technique that allows observation and recording of various indicators of an individual's choice strategy (see e.g., Mintz et al. 1997; Mintz 2003, 2004b). Some of the unique capabilities of the computerized decision process tracers as a research tool are their ability to detect various decision strategies, to test the effects of multiple situational and personal factors on decision processing and outcomes, to deal with counterfactual data and scenarios, and to serve as a training device (Mintz 2003, 2004b).

Strengths and Weaknesses of Experimental Methods

Strengths

As summarized by McDermott (2002a, 2002b), experimental methodology has four distinctive strengths relative to other political science methods: (1) the ability to derive causal inferences; (2) experimental control; (3) precise measurement; and (4) the ability to explore the details of given processes (McConahay 1973, c.f., McDermott 2002b).

The most significant comparative advantage of experiments lies in their potentially high degree of internal validity. Internal validity refers to whether you are

studying what you think you are studying. Can an experimenter be confident that changes in the independent variable caused changes in the dependent variable? This is primarily determined by the design of the experiments. Ideally, the experimenter can be confident that the manipulation of the independent variable is the cause of any differences seen in the dependent variables. McDermott (2002b) claims that no other methodology can offer such strong support for the causal inferences that experiments allow. Thus, "the major advantage of laboratory experiments is in its ability to provide us with unambiguous evidence about causation" (Aronson and Carlsmith 1968, 10).

Experiments allow the investigator to have control over the testing environment. Experimenters create the experimental protocol and control the experimental environment, and more importantly, the random assignment of subjects to conditions (McDermott 2002a, Kinder and Palfrey 1993). The randomization process assures that the observed differences in outcome can be attributed confidently *only* to manipulations. Moreover, the experimenter can decide which independent variables to manipulate.

Laboratory experiments allow the experimenters to design and implement the desired measures and ensure that they are administered consistently. This will help to eliminate extraneous factors that might contaminate a study by inducing spurious results.

Experiments offer the opportunity to explore phenomena of interest in great detail. Complex relationship can be broken down and investigated in smaller unites in order to see which part of the process results in the differences of interest. In addition, experiments allow particular relationships to be explored in the presence or absence of

other variables, so that the conditions under which certain relationships hold can be examined as well (McDermott 2002a).

Weaknesses

Clearly, like any other methods, experiments are not always the ideal methodology. Experimentation is just one of many methods that can be used to examine political phenomena of interest. Most of the popular concerns about the disadvantages of experiments revolve around questions of external validity and how widely the findings of the laboratory with college undergraduates apply to real-world decision makers and phenomena (McDermott 2002a, 2002b; Kinder and Palfrey 1993). Obviously, the best way to deal with this problem would be to sample directly from the populations of interest. Etheredge (1978) conducted a study with 126 career Foreign Service officers at the State Department to examine "how emotional predispositions might shape elite foreign policy thinking." Another strategy involves the utilization of simulations with real or former decision makers with a hypothetical or past decision task as a stimulus. For example, using top-ranking officers in the U.S. Air Force, Mintz et al. (1997) found that national security decision makers use a mixture of strategies in arriving at a decision. Furthermore, their strategy selection and choice are significantly influenced by the structure of the choice set, i.e., static vs. dynamic. More recently, Mintz (2004b) again used senior U.S. Air Force officers to test whether and how familiar versus unfamiliar decision tasks affect decision strategy change during the decision making process.

Another problem with external validity is that it is difficult, in the laboratory, to replicate key conditions that operate on political actors in the real world. Subjects typically meet only for a short period of time, focusing on a decision task with limited information. This results in generally a low sense of engagement by the subjects. Furthermore, a lot of decision making issues in international relations evolve over long periods of time, e.g., the U.S.-Soviet interactions during the Cold War, in which decision makers have histories and shadows of the future to account for. It is difficult to incorporate the temporal components into experimentations. Most of the existing researches focus on one-shot decision tasks due to this constraint.

Many aspects of real-world complexities are also difficult to simulate in the laboratory such as bureaucratic norms and nuances, relationship of authority, and etc. Subjects may behave one way in the relative free and vacuum-alike experimental settings, but quite another when acting within the constrained organizational or bureaucratic environment where real political decisions take place (McDermott 2002b). Failure to incorporate these constraints into experiments might restrict the applicability of experimental results to the real world.

Experiments can also be biased by an experimenter setting up an experiment in a way that reflects her own beliefs and expectations (Kinder and Palfrey 1993). The researcher may consciously or unconsciously induce the subjects to react in the direction compatible with the hypotheses. Biases of such kind great threaten internal validity of the experiments.

Conclusion

Experimentation is one of many methods that can be used to examine political phenomena. The primary advantage of experiments is that they offer unparalleled control over the variables of interest. This is because the experimental method permits the systematic manipulation of variables in a controlled environment with randomly assigned subjects. Experiments thus offer the highest degree of internal validity that enables the experimenters to make causal arguments about which factors cause certain outcomes and which do not.

Another advantage of experiments results from the scientific rigor built into the process. Experimenters remain aware of, and retain control over, the independent variables of interest. Experimental results are recorded as dependent variables. Implementing statistical analysis, relationships between these variables and interactions among them can be tested in detail.

Despite the general concern on external validity of experimental results, the introduction of experimentations has greatly enriched our understanding of international politics. Combining with other methods, such as formal models, experimental researches render more robust test of existing theories. Experimental method also distinguishes itself from other methods by enabling researchers to examine decision making processes as well as decision outcomes.

This dissertation looks into individual foreign policy decision making behavior under risk. Hypotheses are derived in relation to both decision processes and outcomes. Experimentation, naturally, serves as the perfect methodological venue for testing those

hypotheses empirically. Specifically, I will employ process-tracing technique. In the following chapter, I shall first proceed to introduce this technique as well as operational measures of the main decision making indicators of interest.

CHAPTER VI

PROCESS-TRACING TECHNIQUES AND FOREIGN POLICY ANALYSIS

Introduction

The study of foreign policy decision making and the cognitive processes undertaken by decision makers en route to a choice are often difficult to determine using standard methodologies. Most of the standard methods techniques used by political scientists are designed to measure the effects of given independent variables on selected dependent variables. As Harte, Westenberg, and van Someren (1994, 95) state, "In the structural modeling approach a subject's judgment strategy is investigated by finding a mathematical function that shows a good fit on the relation between the provided information (the stimuli) on the one hand and the judgments (the outcomes) on the other hand." Moreover, these standard methods usually focus on outcome validity rather than process validity (Mintz and Geva 1997). As Simon (1976, 261) states "The variance analysis paradigm, designed to test whether particular stimulus variables do or do not have an effect upon response variables, is largely useless for discovering and testing process models to explain what goes on between the appearance of stimulus and performance of response." To better understand the processes of decision making, more appropriate methods are desired.

Process-tracing techniques are a step in the right direction. In the process-tracing approach the focal point is the process itself, while examining the relation between stimuli and outcomes at the same time. Svenson (1979, 98) notes that the aim of process tracing is to "reveal a train of thought, called a cognitive process, leading to a final

decision or solution. When mapping this process it is necessary to know *what* content or information is processed and how it is processed" (italics in original). Process-tracing methods focus on process validity, the manner in which decision makers process information, and can even by used to begin to study the link between process validity. Process-tracing techniques are used extensively in the psychology, social psychology, and cognitive psychology sciences. With the exception of a few groups of scholars, it is rarely utilized in political science (see e.g., Geva, Redd, and Mintz 2000; Johnson and Riggle 1994; Lau 1995; Lau and Redlawsk 1992; Mintz and Geva 1997; Mintz et al. 1997; Riggle and Johnson 1996; Taber and Steenbergen 1995; Mintz 2004b). In this chapter, I address types of, as well as measures and indicators used in, process-tracing techniques. Before doing so, however, it is necessary to introduce important concepts such as decision tasks, units, matrices, and rules and strategies. Doing so will illustrate why process-tracing methods are needed for the study of cognitive processes in foreign policy decision making. I break these concepts up into three sections: (a) decision tasks and matrices, (b) types of process-tracing techniques, and (c) operationalization of decision strategies.

Decision Tasks and Matrices

A decision task ordinarily consists of a choice of one alternative from a set of several alternatives. The decision task or "decision" is defined by Steinbruner (1974, 16) as "a choice made by either an individual or a group of individuals (and it matters which) in pursuit of some purpose." The decision task, therefore, comprises the process

by which information is gathered, organized, and processed so that the decision maker can choose a given alternative out of a portfolio of possible alternatives.

This is, however, a simplified version of the typical decision task. Payne, Bettman, and Johnson (1993) present a more complex and varied version of what constitutes a decision task. They (ibid.) outline three basic components of decision problems: (1) the alternatives available to the decision maker, (2) contingencies or events that link actions to outcomes, as well as the probabilities associated with those events, and (3) the values associated with the outcomes. Decision tasks, then, are comprised of these components as well as a goal statement, such as choose the preferred alternative (ibid.). In reality, though, decision tasks vary from situation to situation. For example, alternatives may be generated by the decision maker(s) instead of presented. Furthermore, decision tasks are frequently not as well structured as the standard description states (Mintz et al. 1997). Quite often, the alternatives, dimensions, probabilities, etc. that comprise a decision task change over time and/or some of these components can even be missing altogether (Anderson 1983). In sum, decision tasks are rarely well defined and structured and are better represented as dynamic in nature wherein the components of the decision task are in a constant state of flux (Mintz et al. 1997; Payne, Bettman, and Johnson 1993).

A decision matrix is simply the manner in which alternatives and dimensions are structured in decision task. Decision making researchers utilize decision matrices to represent information presented to decision makers. For example, alternatives are often displayed as the columns of a matrix while the dimensions form the rows (Geva et al.

2000). It is not necessary to do so exactly in this manner, i.e., the alternatives and dimensions could switch places. As the nexus of the alternatives and dimensions are information bins. These information bins contain information about the utility of pursuing a particular alternative with respect to a given dimension (e.g., see Mintz et al. 1997). A matrix could contain large numbers of alternatives and dimensions, or as few as two alternatives and two dimensions. Table 6-1 portrays a typical decision matrix as it might be presented to a subject in an experimental setting.

This is not to say, in a deterministic manner, that decision makers formulate decision tasks in terms of decision matrices. To be sure, decision makers most likely formulate decision tasks in many different ways, not all of which would consist of a structured decision matrix. Decision matrices are herein simply as a way to present information in an organized fashion to decision makers in an experimental setting, or to refer to the information set that decision makers may be considering in a given decision task.

Types of Process-Tracing Techniques

Foreign policy analysts frequently borrow ideas, concepts, and theories from social and cognitive psychology, yet these theories are often not easily testable using only either historical case studies or empirical large-N data analysis (Redd 2000). Payne (1976) was perhaps the first scholar to introduce and call for the use of process-tracing techniques in the study of decision making in general (see also Herstein 1981; Olshavsky 1979; Payne 1982; Svenson 1979). In the late 1970s, George (1979) argued for the use of process-tracing techniques in single case studies, stating that “Process-tracing

Table 6-1

The Decision Board Platform

	Alternatives			
Dimension	*Blockade*	*Sanction*	*Use of Force*	*Do Nothing*
Political	Implications	Implications	Implications	Implications
Military	Implications	Implications	Implications	Implications
Economic	Implications	Implications	Implications	Implications
Diplomatic	Implications	Implications	Implications	Implications
Your Choice:	_____	_____	_____	_____

Reproduced from: Mintz, Alex. 2004. "Foreign Policy Decision Making in Familiar and Unfamiliar Settings: An Experimental Study of High-Ranking Military Officers." *Journal of Conflict Resolution* 48: 91-104.

seeks to establish the ways in which the actor's beliefs influenced his receptivity to an assessment of incoming information about the situation, his definition of the situation, his identification and evaluation of options, as well as, finally, his choice of a course of action."

Process tracing's main strength lies in its ability to identify specific strategies decision makers utilize and to test for the effects of structural, environment, and personal variables on the decision process and its outcome (Redd 2000). As noted by Abelson and Levi (1985, 256), "Process-tracing models have been used to determine what information individuals seek to acquire before making a choice, how this information is structured to form a cognitive representation of the problem, and how the representation is processed in order to make a choice." They further identify three major types of process-tracing methods utilized to tap individuals' information acquisition and processing: the recording of eye movements, the monitoring of explicit information search, and the collection of verbal protocols (ibid.). In the study of foreign policy decision making, the most frequently employed process-tracing method is the monitoring of explicit information search (see e.g., Mintz 2004; Redd 2000; Mintz et al. 1997, Mintz and Geva 1997, and etc.)[7]

Ford et al. (1989) note that process tracing method identifies information that is being accessed by the decision maker to form a judgment, as well as the order in which that information is being acquired. The knowledge of these procedures can then be used

[7] Due to the fact that the monitoring of explicit information search method is the dominant research method utilized in the study of foreign policy decision making, I subsequently equivocate this specific method with process-tracing methods in general.

to infer the decision rules and strategies employed by decision makers en route to choices. Moreover, Ford et al. (ibid., 77) state that examining the decision maker's pattern of information acquisition can "identify alternative models or strategies used in making a decision."

There are various types of techniques to trace information acquisition pattern. In single case studies, scholars typically employ some form of content analysis in an attempt to establish causal interpretation. Controlled comparisons are used in situations where "two or more appropriately selected cases are studied together" (George 1979, 114). Abelson and Levi (1985) identify three major types of process-tracing methods utilized to tap individuals' information acquisition and processing: the recording of eye movements, the monitoring of explicit information search, and the collection of verbal protocols (see also Newell and Simon 1972; Nisbett and Wilson 1977; Payne, Braunstein, and Carroll 1978; Svenson 1979).

The first type, Eye movement recordings, generally focus on measuring various characteristics such as duration, fixation density, and sequence of fixations that presumably indicate how the individual was acquiring and processing information (Abelson and Levi 1985). These techniques have been used to study decision behavior (e.g., Rosen and Rosenkoetter 1976; Russo 1978; Russo and Rosen 1975). Although the eye movement recordings method appears to be a useful and straightforward technique for understanding information acquisition and processing, there are many technical problems associated with this process-tracing technique (Redd 2000). Most of the problems are related to the expensive, cumbersome, and uncomfortable apparatus

needed to “trace” eye movements (Payne, Braunstein, and Carroll 1978). To use this method, it is also necessary to keep the items of information relatively few and spaced far enough apart to permit precise measurement (Abelson and Levi 1985).

The second type, verbal protocols, collects data while the subject is working on the decision task. The subject is asked to “think loud,” to report every passing thought during the process of the decision task (Payne, Braunstein, and Carroll 1978). Collected protocols are then interpreted in order to delineate the subject’s sequence of information processing operations (Newell and Simon 1972). Two specific techniques are involved to collect verbal protocols. The first one, a concurrent verbalization method, requires the collection of verbal reports during the process of the performance of decision task (see e.g., Ericsson and Simon 1980; Abelson and Levi 1985). A retrospective method, as the second technique, will need the subject to recollect the cognitive process after the decision task is completed (see e.g., Abelson and Levi 1985). Abelson and Levi (1985) prescribe four typical uses of protocol data. First, verbal protocol data may be used exploratory tool to generate hypotheses during early phases of research on decision behavior. Second, protocol data can supplement data collected via other methods. Third, protocol data can be used to test hypotheses about decision behavior. Fourth, protocol data can be used to build detailed models of individuals’ decision processes, formalized in computer algorithms.

However, verbal protocol techniques do have significant disadvantages and weaknesses (Redd 2000). They have been questioned on the grounds of both reliability and validity. For example, after reviewing a large number of studies in perception,

problem solving, and social psychology, Nisbett and Wilson (1977) conclude that people often cannot report accurately on the effects of particular stimuli on responses. Further, as Svenson (1979, 98) posits, "All interpretations of think-aloud protocols rest on the assumption that the decision maker gives a correct description of at least some parts of his train of thought during the decision process." After all, Svenson (ibid., 79) states "the value of verbal reports as indicators of cognitive processes is quite pessimistic." Redd (2000) also notes that verbal protocol techniques is rather labor-intensive, requiring intensive amount of time and work in order to analyze the data.

The third type, monitoring explicit information search requires the decision makers to search explicitly for information about the available alternatives. This method typically involves research instrument that contains information boards. Payne (1976) started to utilize information boards to elicit explicit information acquisition strategies in decision making (see also Bettman and Jacoby 1976; Schaninger and Sciglimpaglia 1981; Thorngate and Maki 1976). By using information board, the decision maker is usually presented with information arranged in a matrix containing the value of each alternative on each attribute, with alternatives listed across the top and the dimensions listed down the sides or vice versa (e.g., see Mintz 2004b, Redd 2000; Mintz and Geva 1997; Mintz et al. 1997; Payne, Braunstein, and Carroll 1978). In Payne's 1976 study, the information board consisted of a matrix of envelopes attached to a piece of cardboard. Inside each envelope, the subject would find a card that has written evaluations of a particular alternative along a specified dimension. Subjects simply selected cards from a desired envelope, read it, turned it over, and then returned the card to the envelope.

Payne was thus able to make inference regarding decision-making process by analyzing the recorded sequence of the cards being viewed. With the advancement of technology, computer-based information retrieval and recording system was firstly utilized by Payne and Braunstein (1978) and it has been continuously improved by decision-making researchers (e.g., see Mintz 2004b; Redd 2000; Mintz and Geva 1997; Mintz et al. 1997; Rahn, Aldrich, and Borgida 1994).

Using monitoring explicit information search approach, particularly the information board technique, relies on a number of assumptions (Abelson and Levi 1985; Payne et al. 1978; Svenson 1979). First, it is assumed that, when a subject looks at or accesses an item of information, that particular item is attended to, encoded, and processed by the subject. Second, a subject's attention to an item is assumed to reflect a purposeful utilization of an information acquisition strategy. Third, longer periods of attention to items of information are assumed to indicate more complex and demanding cognitive processes than are shorter periods (Abelson and Levi 1985).

Monitoring explicit information search technique has its own weaknesses. As noticed by Payne et al. (1978), this technique focuses exclusively on a decision maker's use of objective and external information. Internal attributes, such as previous knowledge and learning, and their effects on decision-making processes cannot be examined by this approach. Verbal protocols, instead, may do a better job in capturing when and how previous experiences and learning play a role in decision processes (Redd 2000). Another problem related to this approach is the underlying assumption, i.e., access to any information item by the subject is assumed to be a meaningful behavior

during the decision process, even though some actions of accessing information items may be purely mistakes. To present a decision making task in the form of a highly-structured information board is often criticized for not reflecting "real-life" decisions.

In spite of the weakness of the information board process-tracing research technique, it is perhaps still the most appropriate technique for studying decision-making behavior in international relations (Redd 2000). By constructing an information board scenario, researchers can incorporate dimensions and alternatives that most frequently appear in "real life" foreign policy decision-making context (see e.g., Geva, Redd, and Mintz 2000; Mintz and Geva 1997; Mintz et al. 1997; Redd 2000; Mintz 2004b). With the advancement of technology, current information board methods have become computer-based, which makes the recording of the decision making process much more precise and accurate. Works using this method have been published and widely acknowledged in the scholarship of international relations (see e.g., Mintz and Geva 1997, Mintz et al. 1997; Redd 2000; Mintz 2004b).

This dissertation uses the Decision Board – Computerized Decision Process Tracing – as the experimental instrument for testing various hypotheses. Due to the nature of this study, subjects are needed from both China and the United States to make the results valid and reliable. The Decision Board is particularly suitable for this study since it is an internet-based decision tracing software with which the researcher does not need to travel between the two countries. Representatives of the researcher within each country can easily recruit subjects and administer the experiments. Experimental data

will be collected and saved in the Decision Board server for the research to analyze. Next, I will discuss the Decision Board software and its utilities in this dissertation.

The core structure of the Decision Board platform, as depicted in Figure 6-1, is a matrix of alternatives and dimensions on which the alternatives are evaluated (see e.g., Mintz et al. 1997; Mintz 2004b). The internet-based computerized software is able to record key feature of the decision-making process. These features are subsequently used to identify decision strategies of policy makers.[8] One of the most important indicators of the decision strategies is the sequence in which the information is accessed by the decision maker (Redd 2000; Mintz 2004b).

A decision task usually consists of the selection of an alternative from a set of available alternatives (see e.g., Mintz 2004b). Each alternative is usually evaluated along multiple dimensions. Alternatives and dimensions are organized in the format of a matrix, usually with the alternatives as the columns and dimensions as the rows or vice versa. Subjects sit in front of a computer terminal, reviewing information and making a decision. The Decision Board will record important parameters of decision-making process.

As shown in Table 6-1, a decision task typically involves choosing from one of A_i alternatives, which are evaluated along different D_j dimensions. The values (V_{ij}) inside the matrix represent the evaluation of a given alternative (A_i) on a given

[8] Version 1.0 of the Decision Board Platform was developed by Alex Mintz and Nehemia Geva of Texas A&M University (Mintz and Geva 1997; Mintz et al. 1997). Version 4.0 is currently in use and available at http://www.decisionboard.org/academic. The Decision Board Simulator 4.0 has been used widely for research, teaching, and training (Mintz 2004b).

dimension (D_j). The nexus of a given alternative with a particular dimension is referred to as an "information bin." These information bins can be opened to reveal their contents by the click of mouse, whereas decisions are made by clicking on the choice box of a desired alternative (Mintz et al. 1997; Redd 2000; Mintz 2004b). As summarized by Mintz (2004b, 52), the computerized Decision Board can record "… (a) the sequence in which decision makers acquire the information, (b) the number of items that respondents view for every alternative along every dimension, and (c) the amount of time that elapses from the time respondents begin the task until they make their choice." The latest Version (4.0) of the Decision Board is also able to present a summarized report of both the decision process and outcome of each individual decision maker and to calculate holistic versus non-holistic search and maximizing versus satisficing decision rules (ibid.)

This dissertation uses the Decision Board Platform (Version 4.0) as the experimental instrument to test hypotheses derived in Chapter IV. The scenario involves an international crisis situation in which citizens of the subject's countries are held hostage by radical groups of another country. The decision maker is presented with four alternatives: do nothing, negotiation, international mediation, and rescue mission. The experimental task and scenario are described in Appendix A.

The implementation of the Decision Board platform is intended to record the information processing strategies and choices made by the decision maker. As discussed previously in Chapter IV, four types of information processing strategies are particularly relevant in foreign policy decision-making. I also derive hypotheses in Chapter IV

regarding the possible effects of gains vs. losses domains on decision strategies and choices. The challenge is, then, how we can identify those decision strategies and operationalize them in a valid manner. In the following section of this chapter, I discuss ways I employ in this study to measure the several process-tracing strategies.

Operationalization of Decision Strategies

There are various ways by which decision strategies may be identified from the actions of subjects in experimental settings using information board techniques. This dissertation only concerns the following four types of decision strategies that are relevant in foreign policy decision-making: holistic vs. non-holistic search, alternative vs. dimension-based search, compensatory vs. noncompensatory strategies, and maximizing vs. satisficing decision strategies. The Decision Board platform (Version 4.0) has integrated algorithms that automatically calculate measures of the two of above-mentioned four types of decision strategies for both each individual subject and each decision scenario as a whole, i.e., holistic vs. non-holistic measure and maximizing vs. satisficing measures. Therefore, the Decision Board (Version 4.0) is ideal for examining both between-subjects variances and between-decision-context variances. I now discuss the logic and rationale for calculating the measures of the two types of decision strategies through the algorithms integrated with the Decision Board (Version 4.0) and the measures I adopted for the rest of the two decision strategies.

Holistic vs. Non-holistic Processing

As discussed previously in Chapter IV, holistic search is much more cognitively demanding than non-holistic search. Decision makers using more holistic search are

very likely to review as much available information as possible before making a decision. Non-holistic decision makers, instead, are likely to take shortcuts during information acquisition process, reviewing only part of the available information (Mintz and Geva 1997, 90). Therefore, given the same decision task with the same amount of information, a holistic decision maker is likely to review more pieces of information than a non-holistic decision maker (see e.g., Choi et. al. 2003; Mintz and Geva 1997).

Such is the logic behind calculating holistic vs. non-holistic measures by the Decision Board (Version 4.0). The Decision Board calculates the ratio of the number of information bins that the subject has accessed relative to the total number of available information bins contained in the decision matrix. The ration runs from "0", implying the subject has not reviewed any information bin, to "1", implying the subject has accessed all available information bins. The higher the ratio, the more holistic the decision strategy that the subject employs.

Alternative vs. Dimension-based Processing

As we have discussed previously, there are two "pure" modes of information acquisition strategies as identified by decision-making researchers (e.g., Ford et al. 1989; Payne, Bettman, and Johnson 1997). The first type, alternative-based processing, indicates that the decision maker reviews sequentially all items for a given alternative across different dimensions, and then, repeats the same pattern for the rest of alternatives. The second type, dimension-based processing, implies a process whereby the decision maker focuses on a given dimension and reviews all the alternatives along this dimension and then proceeds to other dimensions in the same manner.

The empirical measures of these two types of decision strategies were firstly suggested by Payne (1976) and subsequently adopted by a host of other decision-making researchers (see e.g., Billings and Scherer 1988; Mintz and Geva 1997; Mintz et al. 1997; Redd 2000; Mintz 2004). This study adopts the so-called Billings and Scherer (1988) search index (see Mintz et al. 1997, Redd 2000, and Mintz 2004b for similar operationalization). The index is used to quantify the search sequence. It ranges from -1 (purely dimension-based processing) to +1 (purely alternative-based processing). The scoring of subjects' moves was determined using Billings and Scherer's (ibid., 10) procedure (see also Herstein 1981; Mintz and Geva 1997; Mintz et al. 1997; Redd 2000; Mintz 2004b):

> Each move to a new piece of information which was within the same alternative and across dimensions was classified as an interdimensional move (alternative-based), while a move within a dimension and across alternatives was labeled as intradimensional (dimension-based). Moves to both a different alternative and a different dimension were labeled as shifts. The search pattern variable is defined as the number of alternative-based moves minus the number of dimensional moves divided by the sum of these two numbers.

The index tallies the number of dimensional moves (d), alternative moves (a), and shifts (s)[9]. The equation $SI = (a - b)/(a + d)$ is employed to define the search index. Positive numbers indicate more alternative-based moves, whereas negative numbers imply dimension-based moves. This measure has been used in numerous decision-making studies that intend to identify alternative vs. dimension-based processing as a decision strategy (see e.g., Mintz and Geva 1997; Mintz et al. 1997; Redd 2000; Mintz 2004b).

[9] In the Billings and Scherer's index, shifts (s) refer to moves that are not either alternative or dimension based.

Compensatory vs. Noncompensatory Strategies

There exist three measures in the literature to differentiate compensatory vs. noncompensatory decision strategies. The first measure focuses on the variability of the information acquisition patterns. With this approach, the researchers firstly need to count the number of information items viewed by the subject for each alternative. Secondly, the standard deviations of the numbers of viewed items for each alternative are calculated and used as an operationalization of the degree of noncompensatory processing (see e.g., Billings and Scherer 1988; Gilliland, Wood, and Schmitt 1994; Payne 1976). Greater variability signifies more noncompensatory processing while zero variability implies compensatory processing. As pointed out by Redd (2000), this approach is highly sensitive to the total number of items accessed by the subject. For example, if the subject reviews all information items in the decision matrix, then, based on this approach, the subject must have been using a noncompensatory strategy since the variability measure reaches to its maximum, even though the subject still may in fact have been using a compensatory strategy (ibid.).

The second measure of compensatory vs. noncompensatory strategy was used by Mintz and Geva (1997). The authors state that

> A noncompensatory principle would imply that subjects would review less information on rejected alternatives than on the chosen alternative. A compensatory process requires the decisionmaker to tally or incorporate the utilities of all the values per alternative and only then to compare the resulting values (ibid., 96)

To derive the measure for compensatory vs. noncompensatory strategy, the authors compared the number of items viewed on the chosen alternative (n_c) with the

number of items viewed on the non-chosen alternatives (n_{nc}). They then employed the following equation:

$$n_{nc} = \left[\left(N - n_{nc} \right) / K \right]$$

where *N* is the total number of items viewed, and *K* is the total number of alternatives -1. A decision maker is found to be using a noncompensatory strategy is the number of items accessed on the chosen alternative is significantly greater than the number of items accessed on non-chosen alternatives (ibid.)

The third measure of compensatory vs. noncompensatory decision strategies is firstly developed by Astorino-Courtois (2000) and also used by Redd (2000). This approach is based on Payne, Bettman, and Johnson's (1993, 30) discussion of consistency vs. selectivity in information processing, in which they state, "more consistent processing across alternatives is indicative of a more compensatory decision strategy" (see also Payne 1976). Within the context of a 4×4 matrix, the index ranges from zero, indicating complete consistency (compensatory processing) in information processing, to sixteen, representing maximum selectivity (noncompensatory processing) (see also Redd 2000, 2003). The commonly used Consistency/Selectivity by alternative measure is as follows:

$$CS_{alt} = \frac{1}{2} \sum \forall y \neq z \left| \sum_{n=1}^{n} a_{yn} - \sum_{n=1}^{n} a_{zn} \right|$$

where *n* represents the number of alternatives in the choice set, and *a* is the number of information bins accessed on each alternative *y*, *z* and so on (Astorino-Courtois 2000;

Redd 2000, 2002). By the same logic, the Consistency/Selectivity by dimension measure is as follows:

$$CS_{\dim} = \frac{1}{2}\sum \forall y \neq z \left| \sum_{n=1}^{n} a_{Un} - \sum_{n=1}^{n} a_{Wn} \right|$$

where *n* represents the number of dimensions in the choice set, and *a* is the number of information bins accessed on each dimension *u*, *w* and so on (Astorino-Courtois 2000; Redd 2000, 2003).

In order to determine the compensatory vs. noncompensatory strategies used by the decision maker via this approach, we need to consider the following elements. First, we need to identify the low and upper limits of the Consistency/Selectivity measures by both dimension and alternative. As in a 4×4 decision matrix, "0" represents complete consistency (compensatory processing) and "16" represents maximum selectivity (noncompensatory processing).[10] Second, these two measures need to be calculated and compared with the lower and upper limits for each individual decision maker's processing behavior. Third, we need to examine the pattern by which the decision maker reviews the information. For example, the roughly same number of information bins accessed per alternative and dimension would suggest a more compensatory searching strategy (Redd 2000, 119). On the other hand, noncompensatory strategies would imply a search characterized by a non-constant searching pattern (Mintz and Geva 1997).

[10] The lower and upper limits of Consistency/Selectivity measures can be determined easily for any size decision matrix. For the purpose of this study, a 4×5 matrix is employed. Therefore, the lower limit (compensatory processing) is "0" and the upper limit (noncompensatory processing) is "16".

More recently, Mintz (2004b) developed a simpler measure of noncompensatory strategy that can empirically capture the essence of political decision making. The theoretical logic behind this new measure is that a decision maker is considered to be using a noncompensatory strategy when an alternative with the highest aggregated utilities across all dimensions is rejected since it has a negative rating on a highly weighted dimension and when this dimension is very important to the decision maker (ibid.). According to poliheuristic theory of decision making, political dimension is inevitably the most subjectively important dimension for leaders (see e.g., Mintz 2004b; Mintz and Geva 1997). Very often, negative political advice leads to the eliminations of the "correct" alternative – the alternative with the highest aggregated utilities – due to the noncompensatory, avoid-major-political-loss principle (Mintz 2004b, 60).

Maximizing vs. Satisficing Strategies

As discussed previously in Chapter IV, a decision maker using maximizing strategy will select an alternative with the maximum utility across all dimensions, whereas a decision maker employing satisficing strategy chooses the alternative that only surpasses a pre-determined threshold. Mintz and Geva (1997, 87) posit that the difference between satisficing and maximizing strategy is that the former consists of comparing alternatives to predetermined values along a selected set of dimensions whereas the latter requires evaluating each alternative on each dimension and comparing the sum expected utilities of all alternatives.

The Decision Board platform (Version 4.0) has a newly developed and integrated algorithm to calculate the maximizing/satisficing measures. A decision maker employs

maximizing strategy when the alternative with the highest overall utility across all dimensions is selected. A decision maker employs satisficing strategy when she chooses an “acceptable” rather than an “optimizing” alternative.

Conclusion

In this chapter, I outlined the methodology that will be used to examine the influence of gains vs. losses domains on information processing and choice under risk in the context of foreign policy decision making. Firstly, I discussed various existing process-tracing techniques in the research of decision making. Secondly, I introduced the Decision Board platform as the chosen experimental instrument for this study. Thirdly, I conceptually defined the decision strategies, along with their operational measures, that will be examined in this study. This chapter, naturally, serves as the methodological foundation for this dissertation. I, then, in the following two chapters, present the cross-national experimental designs testing the hypotheses derived in Chapter IV and the results.

CHAPTER VII

THE EFFECTS OF GAINS VS. LOSSES ON FOREIGN POLICY DECISION MAKING: EXPERIMENTAL PROCEDURE

Introduction

Prospect theory is a theory about decision making under risk. One of its major theoretical propositions claims that people are risk seeking in the domain of losses and risk averse in the domain of losses. In Chapter IV, I extend prospect theory and propose that gains vs. losses domains affect not only decision choices but also the selection of decision strategies under risk. I also derive hypotheses reflecting the effects of gain vs. loss domains on the selection of holistic vs. non-holistic search, alternative vs. dimension-based processing, compensatory vs. noncompensatory strategies, and maximizing vs. satisficing strategies.

In this study, I utilize process-tracing techniques to test for the effects of gains vs. losses domains on decision strategies and choices in the context of foreign policy decision making under risk. In this chapter, I present the experimental design and procedure for testing those hypotheses derived in Chapter IV.

Process-Tracing Methods

This study used the information board techniques discussed in Chapter VI. Specifically, the "moves" of decision makers were recorded using a computerized decision process tracer – the Decision Board Platform (Version 4.0) (Mintz 2004b; Redd 2000; Mintz and Geva 1997; Mintz et al. 1997). The moves of the decision maker were then used to identify their choices and to infer specific decision strategies, i.e., holistic vs.

non-holistic, alternative vs. dimension-based, compensatory vs. noncompensatory, and maximizing vs. satisficing decision strategies (Mintz 2004b; Redd 2000).

The Decision Board Platform (Version 4.0)

This study utilized the Decision Board described in detail in Chapter VI and in Mintz and Geva (1997), Mintz et al. (1997), Redd (2000), and Mintz (2004b). Figure 7-1 portrays the foreign policy decision board main screen as it appeared in the experiment.

Two foreign policy crisis scenarios were used to introduce alternatives and dimensions into the decision board. Both scenarios dealt with an identical hypothetical crisis where citizens of the decision maker's country were taken hostage by a radical group in another country. The difference between the two scenarios was that two contexts were created with one situating the decision maker in the domain of gain while another putting the decision maker in the domain of loss. In both contexts, the decision maker was presented with four alternatives:

- do nothing,
- negotiation,
- third-party mediation, and
- rescue mission.

The dimensions that were employed in both scenarios represent decision criteria that were found to be relevant in other studies of foreign policy decisions in international

Figure 7-1: Foreign Policy Decision Board

Decision Board	Yield	Negotiation	Third-Party Mediation	Rescue Mission	Weight
Political	Select	Select	Select	Select	Add
Economic	Select	Select	Select	Select	Add
Foreign Affairs	Select	Select	Select	Select	Add
Military	Select	Select	Select	Select	Add
Casualty	Select	Select	Select	Select	Add
Final Choice:					

Final Decision

Source: The Decision Board (4.0) – Computerized Decision Process Tracing (http://www.decisionboard.org/academic)

relations (see James and Oneal 1991; Morgan and Bickers 1992; Ostrom and Job 1986; Yang 1999; Scobell 2003; Huang et al. 1992)[11] and the particular nature of hostage crisis. Hence, the dimensions included in the Decision Board were the following:

- political,
- economic,
- international,
- military, and
- casualty.

Following the definition of the four alternatives and five dimensions, the values were inserted in the decision matrix. These values consisted of a descriptive statement and a summarizing numeric value (on a scale from -10 to +10). The summarizing value may come from two sources. First, the decision maker can speculate, on the basis of her or his stored beliefs (Taber and Steenbergen 1995). For example, he or she may evaluate the "rescue mission" option in terms of public approval and decide that it is too costly (Mintz et al. 1997). Converting such an evaluation to a scale, the decision maker assigns a negative score, -1- or -9, to this alternative on the political dimension. Second, the values of the matrix can also stem, certainly, from an external source to the decision maker (Redd 2000). A credible source, such as the foreign minister, may tell the chief executive that "third-party mediation" can be very beneficial to the nation's image in the

[11] The derivation of the dimensions are inferred from quantitative studies on foreign policy decisions made by U.S. Presidents (see e.g., Ostrom and Job 1986; James and Oneal 1991; Morgan and Bickers 1992) and Chinese use of force (Yang 1999; Huang et al. 1992). There is an abundance of case studies that examine Chinese foreign policy also confirmed the dimensions that are relevant adopted by this study (see e.g., Scobell 2003)

international community, implying a high positive score (e.g., a score of 9) for this alternative on the international dimension. Naturally, the extent of advisers' influence on these scores may represent various factors associated with the decision maker's expertise and susceptibility to influence (Redd 2002). Thus, as in Mintz (2004b), Redd (2002), and Mintz et al. (1997), the alternatives and their values were introduced into the Decision Board as being provided by chief advisers from various fields to the decision maker.

Method

Subjects

Levy (1992b) notices that nearly all experimental work on prospect theory has been conducted on American subjects. That casts doubt on the reliability and robustness of the theory. In order to cure this design problem, I firstly utilized subjects from the U.S. and then replicated the identical experimental procedures with subjects from the People's Republic of China. 65 undergraduate students from the U.S. participated in the experiment.[12] They were recruited from several political science courses. On the Chinese side, 62 undergraduate students from Foreign Affairs College, Beijing, participated in the experiment in China. These students are mostly undergraduate students majoring in international studies.

[12] Previous experimental/simulation research in international relations also used students to test specific decision hypotheses (see Beer et al. 1987; Boettcher 1995). Zinnes (1966) replicated World War I decisions in a simulation study using high school students. Mintz et al. (1995), using the Foreign Policy Decision Board Platform, obtained similar results using both college students and Air Force Commanders (see also Mintz et al. 1997). Redd (2000) used undergraduate students to test for the effects of advisor groups on foreign policy decision making.

Design

The basic structure of the experiment was a one-factor independent-groups factorial design. The factor was domains (gains vs. losses).

Independent and Dependent Variables

The independent variables consisted of the gain vs. loss domains.

The dependent variables in this study consisted of two categories: choices and decision strategies (holistic vs. non-holistic search, alternative vs. dimension-based processing, compensatory vs. noncompensatory strategies, and maximizing vs. satisficing strategies).

Choices

The subjects are provided with, via the Decision Board Platform, a foreign policy crisis that requires the selection one out of four decision alternatives. The Decision Board will record the choice that each subject makes.

Decision Strategies

The decision strategies to be examined in this study include: holistic vs. non-holistic search; compensatory vs. noncompensatory processing; dimension vs. alternative-based strategies; and maximizing vs. satisficing strategies.

(1) Holistic vs. Non-holistic Search

The Decision Board will calculate the ratio of the number of information bins that the subject has accessed relative to the total number of available information bins contained in the decision matrix. The ration runs from “0”, implying the subject has not reviewed any information bin, to “1”, implying the subject has accessed all available

information bins. The higher the ratio, the more holistic the decision strategy that the subject employs.

(2) Alternative vs. Dimension-based Processing

This study adopts the so-called Billings and Scherer (1988) search index (see Mintz et al. 1997, Redd 2000, and Mintz 2004b for similar operationalization). The index is used to quantify the search sequence. It ranges from -1 (purely dimension-based processing) to +1 (purely alternative-based processing).

(3) Compensatory vs. Noncompensatory Strategies

Mintz (2004b) developed a sounder yet simpler measure of noncompensatory strategy that can empirically capture the essence of political decision making. The theoretical logic behind this new measure is that a decision maker is considered to be using a noncompensatory strategy when an alternative with the highest aggregated utilities across all dimensions is rejected since it has a negative rating on the highest weighted dimension (ibid.). According to poliheuristic theory of decision making, political dimension is inevitably the most subjectively important dimension for leaders (see e.g., Mintz 2004a; Mintz and Geva 1997). Very often, negative political advice leads to the eliminations of the "correct" alternative – the alternative with the highest aggregated utilities – due to the noncompensatory, avoid-major-political-loss principle (Mintz 2004b, 60).

(4) Maximizing vs. Satisficing Strategies

The Decision Board platform (Version 4.0) has a newly developed and integrated algorithm to calculate the maximizing/satisficing measures. A decision maker employs

maximizing strategy when the alternative with the highest overall utility across all dimensions is selected. A decision maker employs satisficing strategy when she chooses an "acceptable" rather than an "optimizing" alternative.

The Research Instrument

Four separate experimental scenarios, each containing a 4 × 5 (alternatives × dimensions) decision matrix, with an identical decision task was implemented in the Decision Board. For American subjects, two scenarios were constructed in English, with one introducing the manipulation of the domain of gain and the other introducing the manipulation of the domain of loss. When replicating with Chinese subjects, two scenarios were likewise constructed in Chinese.[13] The translations between the English and Chinese scenarios followed the technique typical to cross-national research as described in Brislin (1970).

As discussed previously, the Decision Board has several advantages: a user-friendly interface, multimedia capacity, the ability to record the cognitive "moves" of decision makers, integrated algorithms to calculate crucial decision strategies for individual decision maker, and Internet-based, multi-lingual platform for cross-national experimental projects. Figure 7-1 portrays the foreign policy crisis decision board main screen used in the experiment. The decision board included twenty information bins, which contained information pertaining to an adviser's evaluation of a given alternative. The decision matrix includes alternatives and advisers/dimensions identified in the

[13] Due to the difference in the nature of political regime type between the U.S. and PRC, the scenarios for American and Chinese subjects are slightly different in the way that the gains vs. losses domains were introduced. Specifically, for the Americans, prospects for re-election was used as an experimental manipulation, whereas, for the Chinese, prospects for rallying enough within-Communist Party support for another term as the top political executive was used.

literature as most often considered by policymakers in a foreign policy crisis (see e.g., Mintz 2004; Redd 2002; Geva, Redd, and Mintz 2000; James and Oneal 1991; Mintz and Geva 1997; Mintz et al. 1997; Ostrom and Job 1986; Huang et al. 1992; Yang 1999; Morgan and Palmer 1999; Scobell 2003). The information was presented to the subjects as an evaluative statement followed by a corresponding numerical evaluation on a scale between "-10" to "+10", with "-10" representing the worst evaluation and "+10" representing the best evaluation. For example, "If we give in to the demands by the terrorists, the public will think the government is incapable and weak. You will definitely lose the election, compounding the economic situation. I would rate this alternative as: -9." Decision makers could open any information bin by clicking on it. Subjects indicated their choice by clicking on the 'Final Choice' button underneath the corresponding alternative.

Research Material

In order to determine the influence of gains vs. losses domains on the usage of decision strategies and decision choices, the following factor was examined.

Manipulation of Gains vs. Losses Domains

Domain refers to whether an action takes place in the perceived realm of gains or of losses (McDermott 1998). Domain can be relatively objective or subjective. For purposes of prospect theory, framing in domain is restricted to a sense of whether the decision maker perceives herself to be acting from a position of gains or losses. Gains or losses can be defined by subjective criteria, such as public opinion polls.

A complication in determining domains derives from the fact that different people may use different criteria in order to define their domain of action. Most foreign policy decision makers may consider their domestic political support to be the crucial variable (see e.g., Mintz and Geva 1997; Mintz et al. 1997). As pointed out earlier, in this study, two foreign policy scenarios, both with an identical decision task, were used in the experiments. The first scenario intends to create a context in which the decision maker perceives herself to be in a domain of gains in terms of the prospect of staying in power as the top political executive of her own country. In order to achieve that effect, a briefing on current domestic and international situations was presented to the subjects as following:[14]

- It is an election year.
- You must be very careful as to how you approach the situation.
- This decision will have a crucial effect on your re-election.
- Your public approval has increased from 52% to 75% during the past three months due to current economic boom.
- Employment rate has increased from 90 % to 95 % in the same period, the highest since 1985.
- Results of recent poll show that 80% of the population supports your administration's foreign policy.
- Statements made by members within your political party recently have shown that they are very optimistic about the chance of your being re-elected.

On the other hand, the second scenario is supposed to situate the decision maker in a domain of losses in terms of the prospect of staying in power. Therefore, a much more depressing briefing on current affairs was introduced to the subjects.

- It is an election year.
- You must be very careful as to how you approach the situation.

[14] The formulation of the two types of briefings in order to achieve the gain vs. loss domain effects were based on existing literature applying prospect theory in international relations (see e.g., McDermott 1998 book; Whyte 1999; etc.).

- This decision will have a crucial effect on your re-election.
- Your public approval has decreased from 75% to 52% during the past three months due to current economic recession.
- Unemployment rate has increased from 5 % to 10 % in the same period, the highest since 1985.
- Results of recent poll show that 80% of the population opposes your administration's foreign policy.
- Statements made by members within your political party recently have shown that they are very pessimistic about the chance of your being re-elected.

With the manipulation of gains vs. losses domains, decision makers were also purposefully to be situated at different reference points, against which they evaluate the impacts of various decision choices.

Procedure

In the U.S., the experiment was administered in the Decision Lab in the department of political science at Texas A&M University where each subject operated individually on a computer terminal with Internet access. In Beijing, China, the experiment was replicated in the student computing center at Foreign Affairs College.

Following the identical procedure in both locations, after logging in the Decision Board Platform (www.decisionboard.org/academic), the subjects were able to see the instructions and decision scenarios. Subjects were informed that they would be presented with a specific international crisis scenario and with a decision matrix containing alternatives and the evaluations of those alternatives by a group of five advisers. The subjects were instructed to make the best choice among the available options. In order to increase the motivation of the subjects to perform the task in a genuine fashion, the subjects were told that they should assume the full responsibility of the top political executive of their country. Their decisions would affect the lives of the

hostages taken by radical groups from another country, the national interests in multiple dimensions, and their own political future. Furthermore, the following political decision making "tips" were presented before the subjects started reviewing the decision matrix:

> 1. Leaders are concerned about their popularity and about their chances of being reelected.
> 2. Leaders know that the use of force bring about a 'rally around the flag' effect and thus increases their popularity.
> 3. Leaders also know that a failure in military actions is likely to reduce their popularity.[15]

The subjects then proceeded to review the information contained in the decision matrix. They were also instructed, before clicking the 'Final Decision' button at the bottom of the page, to also weight how important each dimension (political, economic, foreign affairs, military, and casualty) is to them by assigning a numerical value on a 0 to 10 scale ('0' represents the least important and '10' represents the most important). This weighting score is important for the Decision Board to identify the maximizing vs. satisficing strategies.

After making the final decision by clicking the 'Final Decision' button, the Decision Board will direct the subjects to a new screen that informs them the experimental session has been successfully completed. After every subject finished the session, the researcher then proceeded to administer a post-decision questionnaire followed by a detailed debriefing.

[15] I am grateful to Professor Karl DeRouren Jr. for suggesting inputting these "tips" into the scenario.

Conclusion

In this chapter, I outlined the experimental design and procedure employed for testing the effects of gains vs. losses domains on decision processes and choices in foreign policy decision making under risk. Specifically, I described the experimental scenarios, the manipulation of gains vs. losses domains, the subjects, and the entire experimental procedure. In the following chapter, I present and discuss experimental results in relation to hypotheses derived in Chapter IV.

CHAPTER VIII

THE EFFECTS OF GAINS VS. LOSSES ON FOREIGN POLICY DECISION MAKING: EXPERIMENTAL RESULTS

Introduction

The central tenet of prospect theory predicts that gains vs. losses domains affect risk propensity. People tend to be risk averse in the domain of gains and risk seeking in the domain of losses. By way of extension, in Chapter IV, I argue that if domains, gains vs. losses, may induce different choices, then, a similar effect may be found on decision making processes as well. I then hypothesize how domains in which the decision maker is situation, gains vs. losses, may affect the selection of decision strategies (holistic vs. non-holistic search, alternative vs. dimension-based processing, compensatory vs. non-compensatory strategies, and maximizing vs. satisficing strategies) in the decision making process.

In Chapter VII, I present experimental design and procedure for testing those hypotheses derived in Chapter IV. In this chapter, I present experimental results and discuss their implications in relevance to the hypotheses. I first re-introduce the hypotheses to be tested.

Hypotheses

Hypotheses Regarding Decision Choice

> ***H1***: In the domain of gains, the decision maker tends to be *risk averse*; in the domain of losses, the decision maker tends to be *risk acceptant*.

Hypotheses Regarding Decision Strategies

> ***H2***: A decision maker in the domain of gains is likely to employ a more *holistic* search than a decision maker in the domain of losses.
>
> ***H3***: A decision maker in the domain of gains is more likely to employ an *alternative-based* processing, whereas a decision maker in the domain of losses is more likely to employ a *dimension-based* processing.
>
> ***H4***: A decision maker in the domain of gains is more likely to employ a *compensatory* decision strategy, whereas a decision maker in the domain of losses is more likely to employ a *non-compensatory* decision strategy.
>
> ***H5***: A decision maker in the domain of gains is more likely to employ a *maximizing* decision strategy, whereas a decision maker in the domain of losses is more likely to employ a *satisficing* decision strategy.

Choices

With regard to decision choices under risk in foreign policy decision making, as shown in Hypothesis 1 (H1), I expect that the classic proposition of prospect theory should apply to subjects from both China and the U.S. In other words, people are risk-seeking in the domain of loss and risk-averse in the domain of gain in spite of cultural differences.

As discussed in Chapter VII, subjects are presented with a foreign policy crisis through the Decision Board Platform. Policy alternatives, relevant dimensions, and evaluations of each policy alternative across every dimension were organized in the format of a decision matrix.

Subjects were to choose from one out of four policy alternatives (Yield, Negotiation, International Mediation, and Military Rescue Mission). In the analysis,

"Yield", "Negotiation", and "International Mediation" were coded as less risky choices. In contrast, "Military Rescue Mission" was coded as the "most-risky" choice.[16]

Since I only focus on discussing the effects of gain vs. loss domains in this chapter, the experiment can be regarded as a one-factor between – groups factorial design. The factor is therefore gain vs. loss domains.

Results

Manipulation Checks

In order to test for validity of the manipulation of gain vs. loss domains, subjects were asked to describe how they were feeling about their political leadership status immediately prior to the time of the crisis by choosing one from the following options: "the worst possible situation", "bad situation", "neutral", "good situation", and "the best possible situation." 100 percent of the subjects in the domain of loss selected the option of "the worst possible situation." 98 percent of the subjects in the domain of gain selected the option of "the best possible situation." Hence, I can conclude that the manipulation of gain vs. loss domains was effective.

The data analysis focused on determining how the gain vs. loss domains and cultural differences influenced choices.

Gains vs. Losses Domains and Choice (H1)

Hypothesis H1 relates to the proportion of subjects who chose the "most-risky" option rather than the "less-risky" option. The common findings in the literature reflect

[16] The option of "Military Rescue Mission" was deemed as the most risky choice is because the tremendous degree of uncertainty associated with the political implications of this option (see also McDermott 1998, Hofstede 1997). If the rescue mission succeeds, the political implication is very positive in that the decision maker's popularity will boost tremendously. However, failure of the mission will result in devastating consequence to the decision maker politically (see Appendix C).

the predominance of the risky option when decision makers are in the domain of loss, while relatively less-risky option is more likely to be chosen in the domain of gain.

Figure 8-1 shows that significantly more American respondents opted for the most risky option in the domain of losses (.82) than those in the domain of gains (.57) ($z = 5.19$ $p < .001$). This provides strong support to hypothesis H1. The same pattern replicates with Chinese decision makers. Specifically, in the domain of gains, 36 percent of the Chinese subjects selected the most risky alternative – "rescue mission." In contrast, significantly more Chinese decision makers in the domain of loss opted for that alternative (68 percent) ($z = 6.13$ $p < .0001$).

The pattern persists if we treat American and Chinese subjects as one single group. Figure 8-2 illustrates the proportion of all subjects, Chinese and American, who opted for the "most-risky" and "less-risky" alternatives. The data were subjected to a *z* test of proportions (Langer and Abelson 1972). Among the decision makers in the domain of gain, only 47 percent chose the most risky option. In contrast, significantly more decision makers (75 percent) in the domain of loss opted for the most risky alternative ($z = 3.29$, $p < .001$) (see Figure 8-2). Hence, this finding replicates the "classic" framing main-effect and supports hypothesis H1. In other words, in the domain of gains, decision makers are more risk averse. In the domain of losses, decision makers tend to be more risk seeking.

Figure 8-1: The Proportion of Participants Choosing the "Most Risky" Option as a Function of Gains vs. Losses by Country

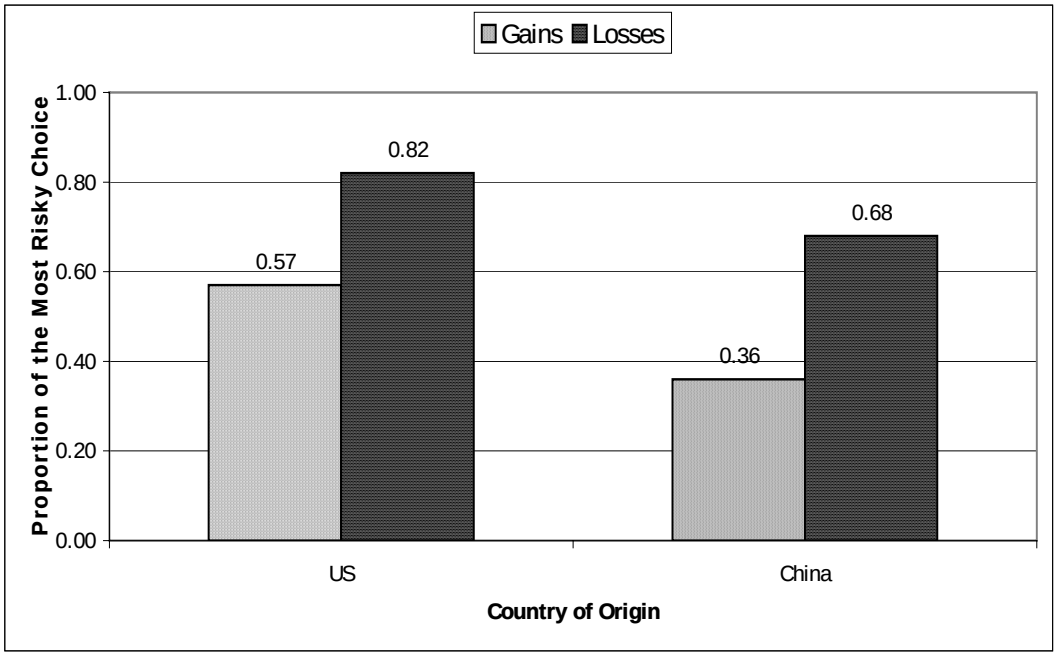
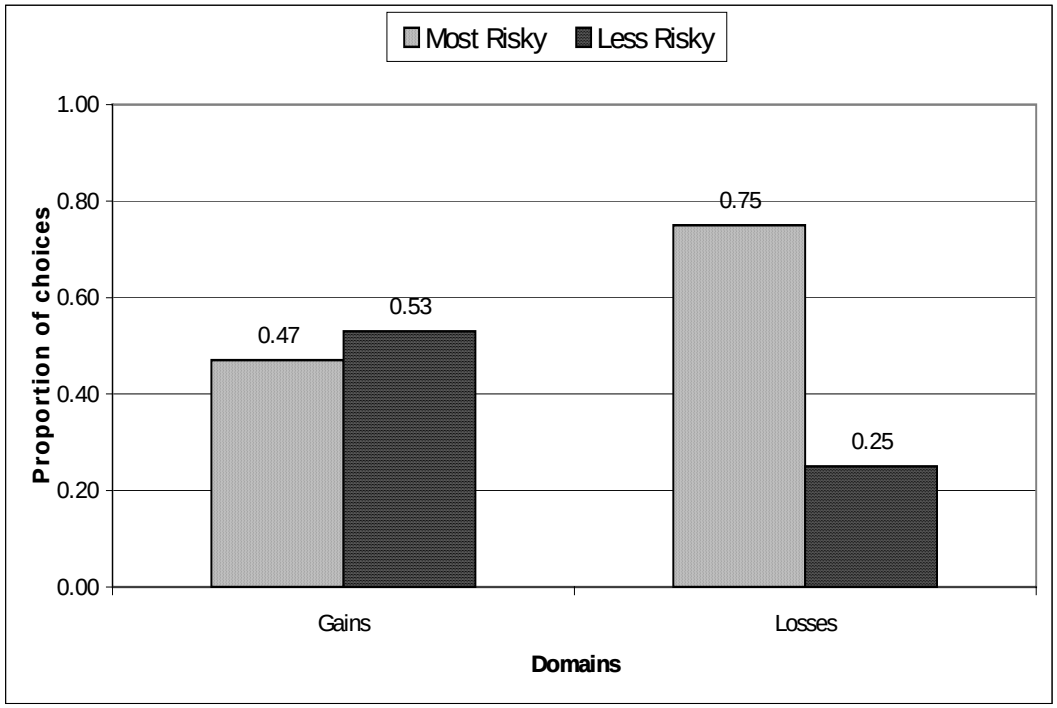


Figure 8-2: The Proportion of All Participants Choosing the "Most-risky" vs. "Less-risky" Options as a Function of Gains vs. Losses



Another look at Figure 8-1 discloses that American subjects exhibited a higher tendency of risk-taking behavior than their Chinese counterparts, as the former proportion to adopt the most risky option, across domains, is higher (.695) than the proportion among the Chinese respondents (.520) ($z = 2.11$ $p < .02$).

This finding corresponds to existing cross-culture psychology literature that compares risk-taking propensities between East Asians and Westerners. According to Vertzberger (1998), culture represents a unified ensemble of ideas that are shared by the member of a society. The ensemble can include sets of common premises, values, expectations, predispositions to action, and preferences for particular ways to organize social activities (ibid.). Culture-based attitudes are more pertinent than any other attitude in unfamiliar, ill-defined, and ambiguous situations (Doty 1986; Gaenslen 1986), in which decision makers look for cues that will allow them to interpret and make sense of available information, that will provide guidelines for responding, and that will give them reasonable confidence in the chosen interpretation and response. Cultural biases thus permeate the perception of risk and the formation of risk preferences. Attitudes toward risk and risk taking are influenced by cultural identity. Decision makers from different cultures worry about different risks (Thompson et al. 1990; Wildavsky and Dake 1990) because "in risk perception, humans act less as individuals and more as social beings that have internalized social pressures and delegated their decision-making processes to institutions. They manage as well as they do, without knowing the risks they face, by following social rules on what to ignore: institutions and their problem-simplifying devices" (Douglas and Wildavsky 1982, 80).

Hofstede (1980, 1997) constructed four operational dimensions of culture in which the one labeled Uncertainty Avoidance (UA) has been used as a measure of attitudes towards risk (see e.g., Hofstede 1997; Zurovchak 1995; Bontempo et al. 1997, etc.). It is a measure of the degree of discomfort with ambiguity, nonconformity, and uncertainty within a society and ranges along a continuum from weak UA to strong UA. The UA dimension gauges how different cultures solve the universal problem of dealing with an uncertain future and the anxiety that accompanies such ambiguity and uncertainty. The basic distinction is between cultures that tolerate ambiguity in a variety of situations, organizations, institutions, and social relations and those that do not.

Hofstede (1997) further introduced the Uncertainty Avoidance Index (UAI) as an empirical measure of this dimension.[17] Based on data collected from 50 countries and 3 regions, one can compare the differences in uncertainty avoidance attitude between countries. Empirical data demonstrate, for example, that the UAI score is significantly higher for Americans (46) than for Chinese (29), implying that Americans are more inclined to avoid uncertainty than Chinese (Hofstede 1997, 113). High uncertainty avoiding cultures shun ambiguous situations (ibid., 116). People in such cultures look for a structure in their organizations, institutions, and relationships which makes events clearly interpretable and predictable. Related to attitudes towards risk, "Paradoxically, they are often prepared to engage in risky behavior in order to reduce ambiguities, like starting a fight with a potential opponent rather than sitting back and waiting." (ibid., 116).

[17] For a thorough description of the Uncertainty Avoidance Index (UAI), see Hofstede (1997) chapter 5 (pp 109 – 138).

In line with Hofstede's positions, cross-cultural psychology research have shown significantly consistent empirical evidence that East Asians (as represented by Chinese, Koreans, and Japanese) are more cautious and risk-avoiding in making social decisions than Westerners (as represented by Americans) (see e.g., Hong 1978; Wright and Phillips 1980; Bontempo et al. 1997; Weber et al. 1998; Weber and Hsee 1998; Weber and Milliman 1997, etc.). The Chinese culture values cautiousness more than taking risks. The traditional philosophy of Confucianism encourages the idea of "thinking over at least three times before taking a risky action." Such a mindset, though originated from ancient China, spreads out to other peoples in East Asia such as Japan and Korea (Nisbett 2003). Risk taking is regarded as an immature and irresponsible behavior. American culture, on the other hand, encourages adventures and risk taking. As Hong (1978) points out, traditional Chinese culture comes closest to the description of a cautious culture because it bestows high value on "Chung Yung", i.e., the Doctrine of the Mean. This Confucian ethnic cherishes moderation, equilibrium, and avoidance of extremes in thoughts and actions (Smith 1973). As Smith explains:

> One of the chief aims of Confucius had been to teach moderation in all things. The nobleminded man avoids going to extremes, and seeks moderation both as regards the expression of opinions and as regards the conduct of affairs…. (The) Analects says, "To go too far is as bad as not going far enough." (Smith 1973, 93)

Based on the above discussions, we may surmise that American subjects' stronger tendency in taking risks than Chinese subjects as shown in Figure 8-1 may be culturally induced.

Decision Strategies

As discussed extensively in Chapter IV, I extend the theoretical arguments of prospect theory on risk choices in the domains of gains and losses to account for the differences in the four categories of information acquisition strategies.

Results

Holistic vs. Non-holistic Search (Hypothesis H2)

As discussed earlier, holistic search is cognitively demanding and exhaustive. Operationally, within the framework of information matrix, holistic vs. non-holistic search is differentiated by the ratio of the accessed 'information bins' relative to the total number of available 'information bins.' The higher the ratio, the more holistic the decision strategy the decision maker employs.

As shown in Figure 8-3, the average percentage of information bins viewed by American subjects is significantly greater in the domain of gains (.72) than in the domain of losses (.61) ($z = 2.19$, $p < .01$). I found the same pattern for Chinese subjects. The average percentage of information bins viewed is 85% in the domain of gains and 73% in the domain of losses.

Hypothesis H2 also receives strong support when we disregard the country origin of the subjects. Figure 8-4 summarizes the holistic measures for all participants in different domains. The mean proportion of information bins viewed (holistic vs. non-holistic search) is significantly higher in the domain of gain (.785) than in the domain of loss (.670) ($z = 1.65$, $p < .05$). This result supports Hypothesis H2 and implies that decision makers in the domain of gain are more *cautious* than those in the domain of loss.

Figure 8-3: The Proportion of Information Bins Viewed (Holistic vs. Non-holistic Search) as a Function of Gains vs. Losses by Country

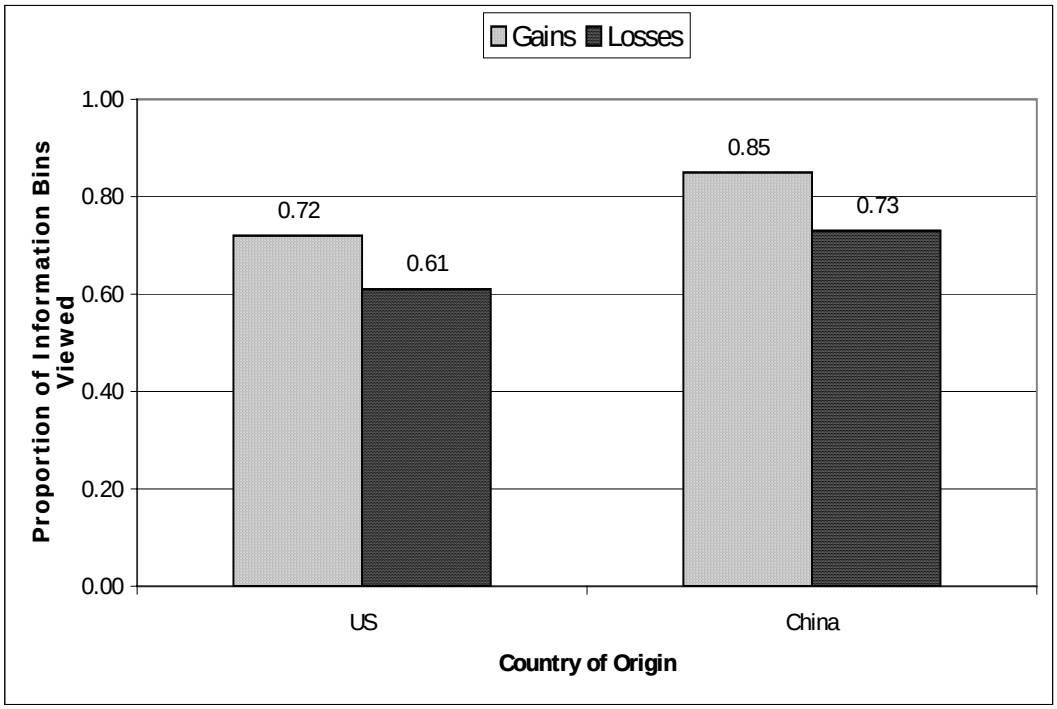
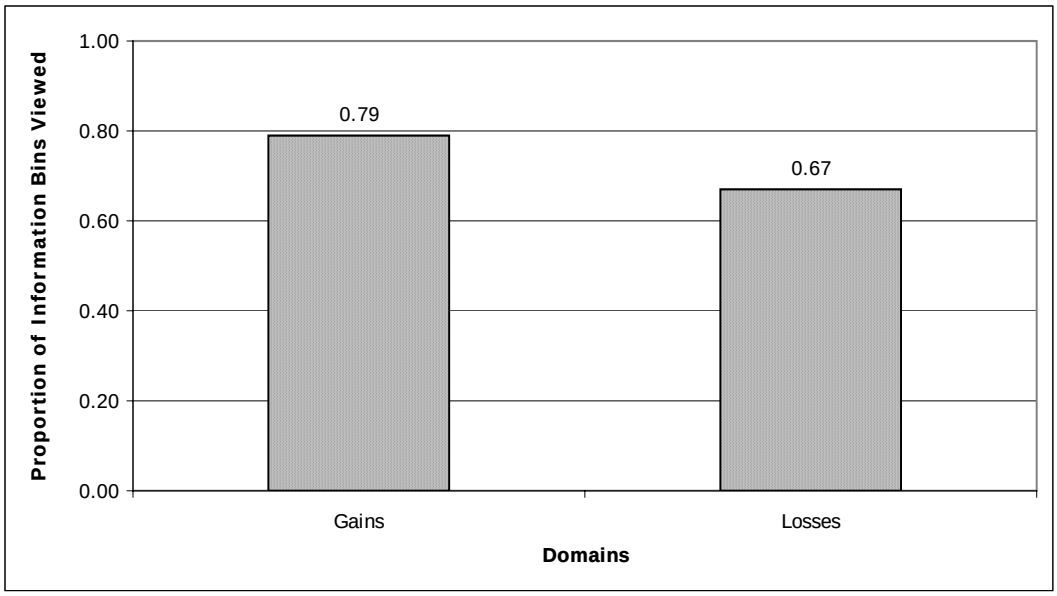


Figure 8-4: The Proportion of Information Bins Viewed (Holistic vs. Non-holistic Search) as a Function of Gains vs. Losses



Fear of the loss of the favorable political status forces them to engage in a much more time consuming and cognitively demanding information acquisition pattern.

Figure 8-3 also reveals that the information bins viewed by Chinese subjects (79%) is significantly greater than those by American subjects (67%) if we disregard the intervening factor of gain vs. loss domains ($z = 1.65$, $p < .05$). This pattern replicates across domains as well. In the domain of gain, Chinese subjects viewed average of 85% of the information bins, whereas American subjects viewed an average of 72%. In the domain of loss, Chinese subjects viewed an average of 73%, greater than American subjects (61%). In other words, Chinese are more "holistic" than Americans in general.

This finding resonates the recent cross-cultural psychology's research on the differences in way of thinking between East Asians (represented by Chinese, Koreans, and Japanese) and Westerners (represented by Americans).

Recently, Nisbett and his colleagues (Nisbett 2003; Nisbett et al. 2001) offered a theoretical framework of two distinct systems of thought -- one held by Easterners and the other held by Westerners. According to Nisbett et al. (2001) as well as other scholars in philosophy of science and ethnography (e.g., Munro 1985; Nakamura 1985; Needham 1962), East Asians have *holistic* assumptions about the universe, dictating that, for example, every element in the universe is somehow inter-connected and that thus an event or object cannot be understood in isolation from the whole. In stark contrast, Westerners hold that the universe consists of atoms that are separate from, and independent of, each other.

Once decision makers judge that a given event requires an explanation and a solution, they typically go through two stages, i.e., information gathering and final attribution (Choi et al. 2003). In the information gathering stage, decision makers search for relevant information that may help them explain and diagnose the event. After determining that they have enough information, decision makers will then go to the final attribution stage in which they will make various types of final attributions, which are typically characterized as internal versus external, stable versus unstable, and controllable versus uncontrollable attributions (Choi et al., ibid.).

The "holistic" versus "analytic" distinction then naturally calls for answers for the following question, i.e., is cultural difference playing a role in the amount of information considered in the information gathering stage? Choi et al. (2003) attempted to address, from social psychological perspective, whether cultural differences contribute to the amount of information people consider before making a final attribution. The authors hypothesized that since the causal theories of East Asians were more holistic and complex than those of Americans, the amount of information considered before making a final attribution would be larger for East Asians than for Americans. This hypothesis was supported through four experimental studies using subjects from Korea and the U.S.

The cross-cultural psychology literature sheds light on unraveling the puzzle in our case that why Chinese subjects viewed consistently more information bins than American subjects across both domains.

Alternative vs. Dimension-based Processing (Hypothesis H3)

The experimental results revealed that American subjects used less alternative-based processing in the domain of losses (M = .04 for the domain of losses and M = .52 for the domain of gains). The same holds true for Chinese subjects (M = .02 for the domain of losses and M = .40 for the domain of gains).

Analysis disregarding country origin of the subjects shows significantly less alternative-based processing was used in the domain of losses, as demonstrated by the strong effect of gains vs. losses domains on the search index, $F(1, 123) = 3.97$ ($p < .05$). Specifically, when the decision makers are in the domain of losses, they tended to use less alternative-based search (M = .03) than those in the domain of gains (M = .46). Hypothesis H3 is therefore partially supported.

As noted by Russo and Dosher (1983), dimension-based (intradimensional) processing is cognitively less demanding than alternative-based (interdimensional) processing. Dimension (attribute) often serves as a heuristic to eliminate alternatives without the need to evaluate them in a complete and exhaustive manner.

A decision maker in the domain of gains tends to be more cautious than a decision maker in the domain of losses in the manner of acquiring and evaluating information before reaching to a decision. Therefore, between the alternative-based processing and the dimension-based processing, a decision maker in the domain of gains

is more likely to employ the former, comparing with a decision maker in the domain of losses.[18]

Compensatory vs. Non-compensatory Strategy (Hypothesis H4)

I found partial support for hypothesis H4 regarding how gains vs. losses domains may affect the selection of compensatory vs. non-compensatory strategies. In order to operationally differentiate whether which strategy decision maker employed, I utilized the measure developed by Mintz (2004b). A decision maker is considered to be using a noncompensatory strategy when an alternative with the highest aggregated utilities across all dimensions is rejected as it has a negative rating on the highest weighted dimension (ibid.). According to poliheuristic theory of decision making, political dimension is inevitably the most subjectively important dimension for leaders (see e.g., Mintz 2004a; Mintz and Geva 1997).

For the American decision makers, in the domain of gains, 68 percent of the subjects did not select the "correct" alternative, i.e., "negotiation" (with a score of – 4 on a scale ranging from – 10 [*very bad*] to + 10 [*very good*] about the political consequence), even thought this alternative had the highest overall score among all alternatives (see Appendix C).[19] In the domain of losses, as many as 92 percent of the

[18] Mintz (2004b) found that changes in strategy were identified by comparing the search pattern (search index) for the first items of information reviewed (stage 1) with the search pattern of the remaining items of information (stage 2). Experimental results demonstrate that there is a decrease in dimension-based processing between the stages. The implication of these findings on this research is that the decision makers in the domain of gain may engage in a dimension-based search in the first stage and then proceed to an alternative-based search in the second stage.

[19] Payne, Bettman, and Johnson (1993) discuss the "accuracy" of decisions in terms of evaluating the quality of choice. They note that the expected utility model is often suggested as a normative decision procedure because it can be derived from more basic principles. The expected utility model also has the property that it utilizes all relevant information presented in the decision task. The use of all relevant

subjects rejected the "correct" alternative (see Figure 8-5). Likewise, for the Chinese decision makers, 64 percent in the domain of gains rejected the "correct" alternative. This proportion increased to 88 percent in the domain of losses. This finding provides strong support for the noncompensatory principle of poliheuristic theory. Negative political advice led the subjects to eliminate the "correct" alternative, due to the noncompensatory, avoid-major-political-loss principle (Mintz 2004b, 60).

Disregarding subject's country of origin, in the domain of gains, 66 percent of all subjects did not select the "correct" alternative. In the domain of losses, as many as 90 percent of all subjects rejected the "correct" alternative (see Figure 8-6). Using the Z test for proportions (Langer and Abelson 1972), I found the main effect for the gains vs. losses domains at the level of $p < .001$ ($z = 3.38$) on the selection of noncompensatory strategy. This finding suggests that even though in both domains, gains and losses, the majority of the decision makers employed noncompensatory strategy (66 percent in the domain of gains and 90 percent in the domain of losses), decision makers in the domain of losses are much more inclined than those in the domain of gains to engage in the noncompensatory elimination process.

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information "represents a 'process' view of rationality: A good decision is seen as one that follows a good decision process" (ibid., 89). Therefore, following Payne, Bettman, and Johnson (ibid.), Redd (2000), and Mintz (2004b), I discuss the choices made in this experiment in terms of adherence to or deviation from a "correct" decision. For example, in the decision scenario, the second alternative, "negotiation", was considered the "correct," or "optimal" choice because its overall cumulative score was 12, compared to other alternatives (see Appendix C).

Figure 8-5: The Proportion of "Incorrect" (noncompensatory) Choices as a Function of Gains vs. Losses by Country

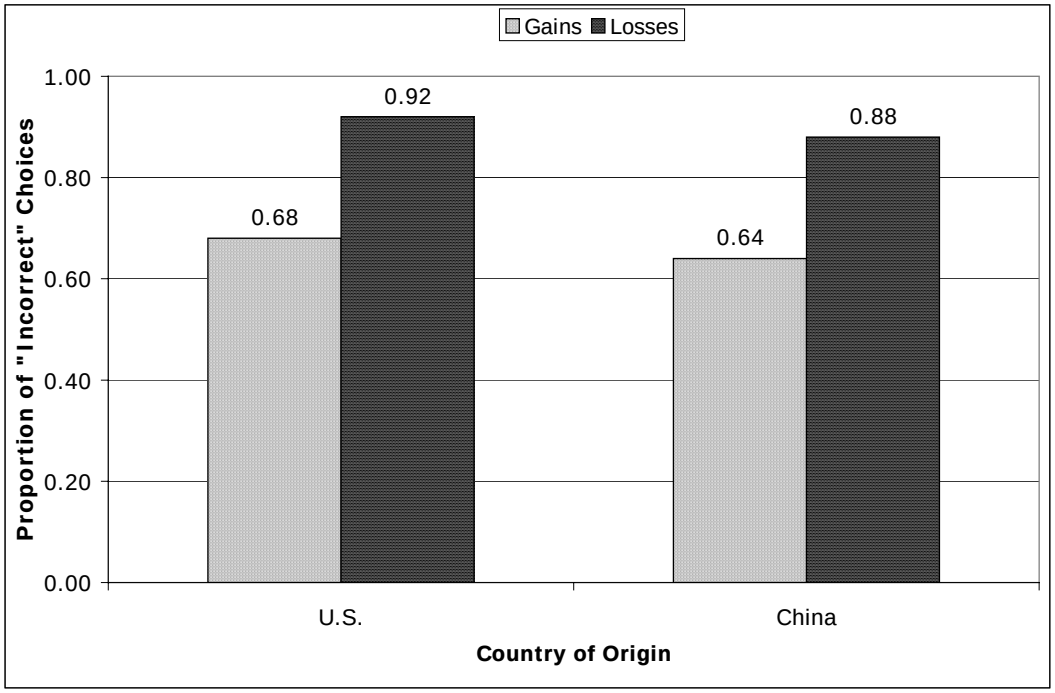
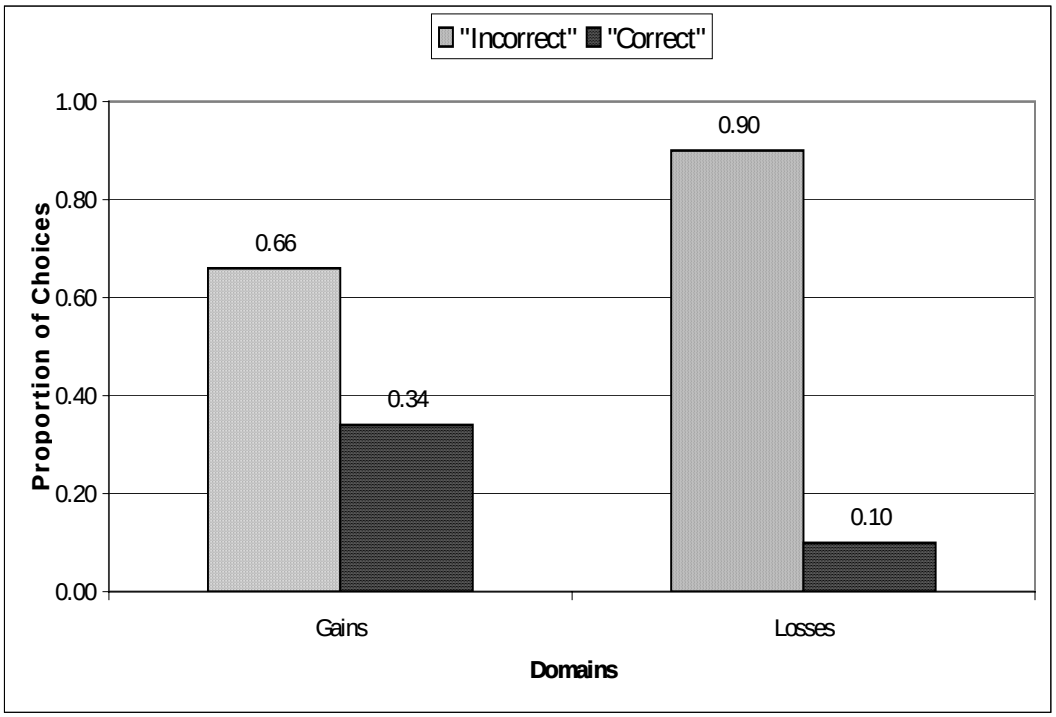


Figure 8-6: The Proportion of "Correct" (compensatory) vs. "Incorrect" (noncompensatory) Choices as a Function of Gains vs. Losses



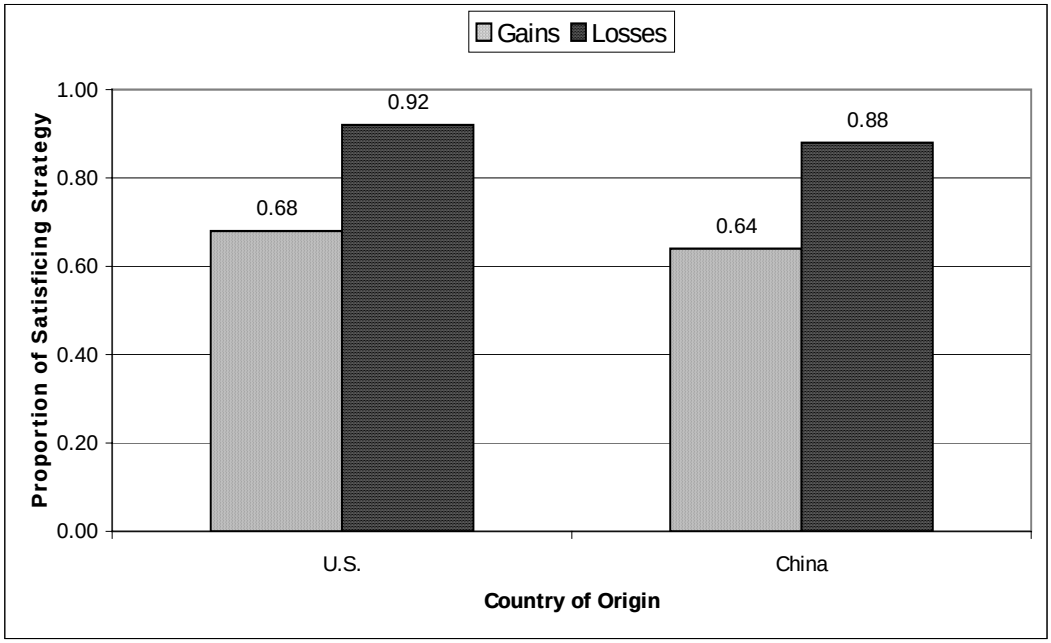
Satisficing vs. Maximizing Strategies (Hypothesis H5)

Hypothesis H5 is supported by the experimental analysis. There has been a great, sometimes polarizing, debate in the literature attempting to ascertain whether decision makers employ maximizing or satisficing decision strategies en route to choice (see e.g., Simon 1945; Geva and Mintz 1997). Conceptually, with satisficing strategy, the decision maker is concerned with finding "acceptable" rather than "optimal" alternatives because it allows the possibility that not all dimensions will be considered before a decision is made (Mintz and Geva 1997). This study focuses on whether and how the gains vs. losses domains will affect the selection of maximizing vs. satisficing decision strategies.

Operationally, a decision maker employs maximizing strategy when the alternative with the highest overall utility across all dimensions is selected. A decision maker employs satisficing strategy when she/he chooses an "acceptable" rather than an "optimizing" alternative. In the decision scenarios, the alternative of "negotiation" entails the highest overall utility across all dimensions (see Appendix C).

Figure 8-7 shows that in the domain of gains, 68 percent of American subjects did not utilize maximizing strategy, rejecting the alternative with the highest overall utility across all dimensions. In the domain of losses, significantly more American decision makers (92 percent) employed satisficing strategy. The pattern replicates for Chinese subjects (64 percent satisficers in the domain of gains and 88 percent satisficers in the domain of losses).

Figure 8-7: The Proportion of Satisficing Strategy Employed as a Function of Gains vs. Losses by Country

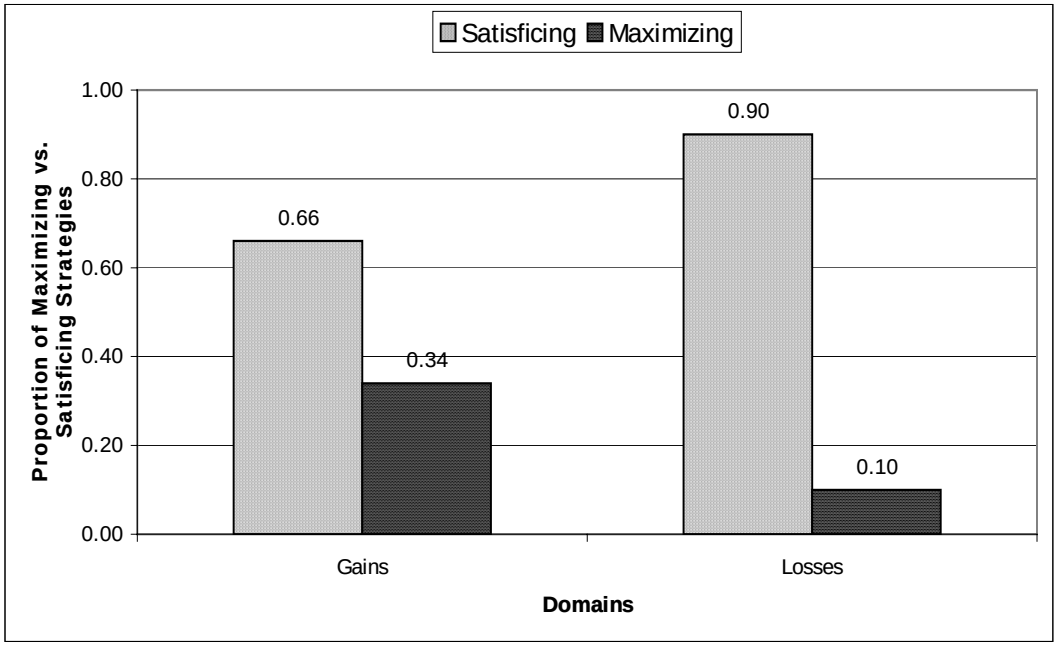


The patterns holds true if we only differentiate the subjects by domains. Figure 8-8 shows that 66 percent of the decision makers in the domain of gains employed satisficing strategy and 90 percent of the decision makers in the domain of losses opted for satisficing strategy ($z = 3.38$ $p < .001$). This finding supports hypothesis H5 and signifies that, in the process of evaluation available alternatives, decision makers in the domain of losses are much more likely to engage in a satisficing decision strategy than those in the domain of gains. The evidence that the majority of decision makers in both domains, gains and losses, employed satisficing strategy, in fact supports the poliheuristic theory's claim that political decision makers 'satisfice' rather than 'maximize' utility (Mintz and Geva 1997; Mintz et al. 1997). This finding also corresponds to the noncompensatory rule posited by poliheuristic theory in that the majority of decision makers in both domains, gain and loss, did not choose the 'optimal' alternative – "negotiation" – even though it has the highest overall utility across all dimensions, simply because it has a negative rating (- 4) over the political dimension.

Conclusion

This chapter reported experimental results examining the effects of gains vs. losses domains on decision strategy selection and choice in a risky foreign policy setting. With regard to decision choices, experimental results replicated one of the classic propositions of prospect theory, i.e., decision makers are risk averse in the domain of gains and risk seeking in the domain of losses. Significantly more subjects in the domain of losses opted for the most risky option than those in the domain of gains. With

Figure 8-8: The Proportion of Maximizing vs. Satisficing Strategies Employed as a Function of Gains vs. Losses



regard to decision strategies, I first found that gains vs. losses domains affect the holistic vs. non-holistic search utilized by the decision maker. In the domain of gains, decision makers are likely to employ a more holistic search than those in the domain of losses. Operationally, decision makers in the domain of gains are likely to review more information items before reaching to a final decision.

Secondly, in partial support for hypothesis H3, the experimental results revealed that the subjects used significantly less alternative-based processing in the domain of losses, as demonstrated by the strong effect of gains vs. losses domains on the search index. Specifically, when the decision makers are in the domain of losses, they tended to use less alternative-based search (M = .03) than those in the domain of gain (M = .46).

Thirdly, domains affect the selection of compensatory vs. noncompensatory strategies in decision making process. The results showed that even though in both domains, gains and losses, the majority of the decision makers employed noncompensatory strategy (66 percent in the domain of gains vs. 90 percent in the domain of losses), decision makers in the domain of losses are much more inclined than those in the domain of gains to engage in the noncompensatory elimination process. The sentiment of risk-averseness leads decision makers in the domain of gains to engage in a more cognitively demanding search than decision makers in the domain of losses.

Fouthly, with regard to the effects of gains vs. losses domains on the selection between maximizing and satisficing strategies, 66 percent of the decision makers in domain of gains employed satisficing strategy and 90 percent of the decision makers in the domain of losses opted for satisficing strategy. This finding partially supports

hypothesis H5 and signifies that, in the process of evaluation available alternatives, decision makers in the domain of losses are much more likely to engage in a satisficing decision strategy than those in the domain of gains.

Lastly, when comparing decision making behavior between Chinese and American subjects, Chinese subjects are found to be consistently more risk averse than American subjects across both gains and losses domains. Furthermore, with regard to decision strategies, experimental analysis shows that Chinese subjects employed more holistic search than American subjects in both domains. I introduce research and theories from cross-cultural psychology literature as a possible explanation for those two differences.

CHAPTER IX

CONCLUSION: GAINS VS. LOSSES, DECISION STRATEGIES, AND CHOICES IN FOREIGN POLICY DECISION MAKING

Introduction

Prospect theory contributes significantly to the understanding of risk taking behavior in foreign policy decision making. One of its major insights, i.e., decision makers tend to be risk averse in the domain of gains and risk seeking in the domain of losses, has been widely utilized to explain foreign policy decision making under risk (see e.g., Farnham 1992; McDermott 1992, 1998; Weyland 1996; Levi and Whyte 1997; Mintz and Geva 1998, etc.).

In this dissertation I intended to extend prospect theory and enrich our understanding of risk taking behavior in foreign policy decision making by incorporating decision processes. Specifically, I attempted to determine how gains vs. losses domains may affect both a decision makers' selection of decision strategies (holistic vs. non-holistic, alternative vs. dimension-based, compensatory vs. noncompensatory, and maximizing vs. satisficing) as well as their choices under risk in foreign policy decision making.

In this concluding chapter, I first provide a summary of the methods used in this study including process-tracing techniques as well as measures of the different decision process strategies examined herein. I then present a synopsis of the finding in Chapters VIII. To conclude, I deliver an overall evaluation of the dissertation and future research plans.

Summary of Findings

In this study, I argue that, based on the logic of prospect theory, given an identical decision task, a decision maker who perceives she herself to be within the domain of gains will be more concerned with the impact of the final decision upon her status quo than a decision maker perceiving herself to be within the domain of losses. Relative to her counterpart in the domain of losses, a decision maker in the domain of gains is much more reluctant to lose her current advantageous possessions. For the decision maker in the domain of losses, the prospective negative impact of the final decision upon her status quo is not considered as crucial as in the eyes of the decision maker in the domain of gains. The potential loss will only make her current *failure* more aggravating. Therefore, it is logical to assume that, given an identical decision making task, a decision maker in the domain of gains will be more cautious than a decision maker in the domain of losses. The reason, based on prospect theory, is that the decision maker in the domain of gains will overvalue the potential negative impact of the decision she will make much more than her counterpart in the domain of losses. I then derive hypotheses positing the effects of gains vs. losses domains on the choice of specific decision strategies, i.e., holistic vs. non-holistic search, alternative vs. dimension-based strategy, compensatory vs. non-compensatory strategy, and maximizing vs. satisficing strategy.

An appropriate method for examining the impact of gains vs. losses domains on decision making processes and choices is process tracing. Process-tracing techniques help researchers in identifying how decision makers acquire information, which then

allows them to make inferences about how this process of information gathering contributed to the final choice (Ford et al. 1989; George 1979; Mintz et al. 1997; Redd 2000, 2002; Mintz 2004b). In this study, utilizing the Decision Board (Version 4.0) – the computerized decision process tracing software developed by Professor Alex Mintz of Texas A&M University – I employed process-tracing techniques in an experimental design to test the hypotheses derived in Chapters IV. In order to render a reliable and robust test of the hypotheses, I firstly used subjects from the U.S. and then replicated the same experiment with subjects in mainland China.

Hypothesis H2 received support from experimental results. I found that gains vs. losses domains affect the selection of holistic vs. non-holistic search in the way that decision makers are more likely to engage in a more holistic search for information in the domain of gains than counterparts in the domain of losses (see Figure 8-4).

With regard to Hypothesis H3, significantly more decision makers opted for alternative-based search when they are in the domain of gains. In contrast, decision makers in the domain of losses engaged in much less alternative-based search before making their final decisions (see Figure 8-6). These findings suggest that the gains vs. losses domains function as a sensitizing device for decision makers en route to a choice. The current advantageous situation (domain of gains) prompts the decision makers to be more concerned with maintaining the status quo. For that purpose, when possible, they will employ a more thorough and demanding information acquisition pattern so that, ideally, they can choose an option that is optimal for as many dimensions as possible. Whereas for decision makers who are in an awkward situation (domain of losses), it is

rather unrealistic to maximize on all dimensions. They are only concerned with maximizing on one or two crucial dimensions that may significantly alter the status quo.

Hypothesis H4 relates gains vs. losses domains to the selection between compensatory vs. noncompensatory strategies. I found that even though in both domains the majority of the decision makers employed noncompensatory strategy (66 percent in the domain of gains and 90 percent in the domain of losses), decision makers in the domain of losses are much more inclined than those in the domain of gains to engage in the noncompensatory elimination process. This finding supports the poliheuristic theory of decision making.

Hypothesis H5 deals with the effect of gains vs. losses domains on the selection of maximizing vs. satisficing strategies. The theoretical expectation was that decision makers in the domain of gains are more likely to select an option that can ideally maximize across as many dimensions as possible. In contrast, while in the domain of losses, decision makers are only willing satisfy the minimum threshold of certain dimensions as, possibly, some dimensions are already in a situation so undesirable that simply cannot be maximized (e.g., domestic economy). The experimental results in Chapter VIII partially supports hypothesis H5 in that even though the majority of decision makers in both domains used satisficing strategy, significantly more decision makers in the domain of losses did so than those in the domain of gains.

As Levy (1992) points out, nearly all experimental work testing prospect theory has been conducted on American subjects. In order to test the robustness and reliability of my theory in this study, I firstly utilized subjects from the U.S. and then replicated the

identical experiment with subjects in mainland China. It is my interest to test whether those hypotheses derived in Chapter IV will hold across cultures. Experimental analysis in Chapter VIII shows that impacts of gains vs. losses domains on decision behavior are consistent across American and Chinese subjects. That demonstrates the soundness and robustness of the theory and hypotheses presented in Chapter IV.

In analyzing the decision behavior by Chinese and American subjects, I also noticed there exist some dissimilarities. Firstly, disregarding the factors of gains vs. losses domains, the average percentage of information bins viewed by Chinese subjects (79%) is significantly greater than those by American subjects (67%). This pattern replicates across domains as well. In other words, Chinese subjects consistently employed more holistic search than American subjects. Secondly, in consistent with the predictions of prospect theory, subjects from both the U.S. and China demonstrate the tendencies to be risk averse in the domain of gains and risk seeking in the domain of losses. On the other hand, however, American subjects are consistently to be more risk seeking than Chinese in both domains.

In order to account for these dissimilarities, I offer theoretical perspectives and empirical findings in cross-cultural psychology. First, in relation to the differences in holistic search, East Asians, as found by researchers in social psychology, are more holistic than Westerners in the patterns of processing information. It corresponds to the finding in this study that Chinese decision makers acquire more information before making a final choice than Americans.

Second, with regard to risk-taking propensities, culture is considered to play a very important role. Based on data collected from 50 countries and 3 regions, Hofstede (1997) compares the differences in uncertainty avoidance attitude between countries. Empirical data demonstrate that Americans are more inclined to avoid uncertainty than Chinese (Hofstede 1997, 113). High uncertainty avoiding cultures shun ambiguous situations (Hofstede ibid., 116). People in such cultures look for a structure in their organizations, institutions, and relationships that makes events clearly interpretable and predictable. Related to attitudes towards risk, "Paradoxically, they are often prepared to engage in risky behavior in order to reduce ambiguities, like starting a fight with a potential opponent rather than sitting back and waiting." (Hofstede ibid., 116). In line with Hofstede's positions, cross-cultural psychology research have shown significantly consistent empirical evidence that East Asians (as represented by Chinese) are more cautious and risk-avoiding in making social decisions than Westerners (as represented by Americans) (see e.g., Hong 1978; Wright and Phillips 1980; Bontempo et al. 1997; Weber et al. 1998; Weber and Hsee 1998; Weber and Milliman 1997, etc.).

Implications

This dissertation began with three goals in mind: (1) to extend prospect theory by examining the effects of gains vs. losses domains on decision processes, (2) to explain variances in risk-taking behavior from a cross-cultural psychology perspective, and (3) to shed light on these issues by utilizing internet-based process-tracing techniques and employing a cross-national experimental design. As such, it addressed both substantive as well as methodological issues. This study has many implications, both for our

understanding of foreign policy processes and choices as they occur in reality, and for the study of foreign policy decision making from both theoretical and methodological grounds.

From a theoretical standpoint, Chapter IV illustrates the significance of decision process in the study of foreign policy decision making under risk. Prospect theory is the leading theory in international relations that focuses on risk taking behavior. Yet, existing expositions of prospect theory focus purely on choices, not process. Extending prospect theory to include decision making processes contribute to a better understanding of risk taking behavior and a necessary advancement of the theory itself.

This study, as I am aware of, is one of the few works in political science that borrow research from cross-cultural psychology literature to explain risk-taking behavior in foreign policy decision making. It sheds light on the contribution of culture to our understanding of foreign policies. The post-Cold War world demands that international relations take civilizations/culture very seriously. The fault lines between civilizations are theorized to be the engine of interstate conflict in the post-Cold War world (see Huntington 1992). Cultural theories, as a significant portion of actor-specific theories, carry tremendous theoretical and applied implications. Of course, I have no intention to discredit the utilities of actor-general theories in international relations such as neo-realism and neo-liberalism. Rather, actor-general and actor-specific theories are complementary. After all, the source of all international politics and all change in international politics is human beings, singly and collectively.

This study also has significant methodological implications for future research in comparative foreign policy decision making. First, the experimental design employed in this study provides for a rigorous analysis of foreign policy processes and outcomes. Second, this is the first study that utilizes internet-based decision making process tracer for cross-national analysis of foreign policy decision making behavior.

Practically, the results derived from experimental analysis can be directly applied to help explain and predict real world foreign policy decision making. For example, the holistic vs. analytic distinction between the Chinese and Americans can be used to explain the EP-3 Spy Plane incident. Lessons can be derived from this case to assist future Sino-U.S. diplomatic interaction. Moreover, the finding that Chinese are generally more risk averse than Americans can also directly applied to real decision making cases.

Limitations

An evaluation of a research project would be incomplete without a critical discussion of its weaknesses. There are a number of limitations in this research. First, even though this study extends prospect theory to incorporate decision processes, however, I did not explore the linkage between processes and outcomes. As previous research suggests, the selection of certain decision strategies will affect the quality of decision choice (see e.g., Redd 2000; Mintz 2004b).

Second, culture is a broad concept. Culture differences may affect organization of meanings, value preferences, and templates for human strategy (Hudson 1997). This study only focuses on a few dimensions of culture, e.g., causal attributions and risk

propensities between Chinese and Americans. Moreover, I intend to contribute the observed differences in decision behavior between Chinese and American subjects to cultural difference without presenting culture-related hypotheses beforehand. This is due to the difficulties of conducting cross-national experimental research. To present and test culture-related hypotheses, I need to introduce more variations into the subject groups for the experiment.

Third, methodologically, this study employs one way ANOVA to evaluate the experimental data. It offers no possibility for statistical control of other factors that can affect risk propensities such as age, gender, race, income, and etc. It is necessary, in future research, to employ other advanced statistical techniques for analysis of risk taking behavior.

Plans for Future Research

While this study is a step in the right direction in extending prospect theory and incorporating culture into foreign policy decision making under risk, there is still much more to do. Further research is needed to expand prospect theory to incorporate the framing/editing phase of decision making. Framing/editing effects refer to the way in which a choice, or an option, can be affected by the order or manner in which it is presented to a decision maker. In many situations, a decision maker does not know the relevant options that are available to her. She must construct and figure out what the options are or have this done for her prior to choice. The next step in research is to examine how gains vs. losses domains affects a decision maker given a situation where no clear options and precise evaluations of options are available.

With regard to culture, this study borrows the conceptualization of culture from social psychology, which tends to have different research focus from that of foreign policy decision making. For example, in the eyes of a social psychologist, it is more important to examine culture from its societal context. For a foreign policy analyst, however, we are more concerned with the political ramifications of culture, which may not necessarily be fully compatible with social psychology. Therefore, it is crucial that we develop a conceptualization and empirical measure of culture by ourselves.

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APPENDIX A

The Scenario:

Domain of Losses

400 of U.S. citizens are currently held hostage by a radical political organization in a rogue country, Gretania. The group demands that we terminate our military presence in that region.

This crisis has drawn tremendous media attention from all over the world. You, as the chief executive of our country, need to make a decision to deal with the crisis. Currently, within the U.S.:

- It is an election year..
- You must be VERY careful as to how you approach the situation.
- This decision will have a crucial effect on your re-election.
- Your public approval has decreased from 75% to 52% during the past three months due to current economic recession.
- Unemployment rate has increased from 5 % to 10 % in the same period, the highest since 1985.
- Results of recent poll show that 80% of the population OPPOSE your administration's foreign policy.
- Statements made by members within your political party recently have shown that they are very pessimistic about the chance of your being re-elected.

Failure to obey terrorists' demand within 48 hours will result in the execution of one hostage per hour. That region is of critical strategic and economic importance to the U.S. due to its rich reserves in both oil and uranium.

This crisis has political, economic, foreign affairs, military, and casualty implications.

Your advisors have suggested the following alternatives to deal with the crisis:
Yield: Give in to the demands by the radical group completely. Withdraw our military and shut down our bases in the region within 48 hours.
Negotiation: Negotiate with the leaders of the radical political group on terms and conditions for releasing the hostages.
Third-party Mediation: Request a third party, a country or an international organization, to mediate the crisis.
Rescue Mission: Send in military special forces for a rescue mission, in hope to rescue all hostages.

In order to help you perform your role, we have provided you with some critical political tips on presidential decision making:
1. Leaders are concerned about their popularity and about their chances of being reelected.
2. Leaders know that the use of force bring about a ‘rally around the flag’ effect and thus increases their popularity.
3. Leaders also know that a failure in military actions is likely to reduce their popularity.
The decision board will indicate how each alternative is evaluated on each dimension

(i.e., political, economic, foreign affairs, military, and casualty) by your advisors. The evaluations are summarized as a rating on a 21-point scale (-10 implies that the option is evaluated in an unfavorable way, 0 implies a neutral position, and 10 implies a favorable evaluation).

The information your have received from your advisors are presented in the decision matrix at the bottom of the screen with Alternatives heading the columns and Dimensions as the rows.

A decision has to be made. Please begin to explore the evaluations given by the advisors, and then determine your choice. Before clicking the 'Final Decision' button at the bottom of the page, please also WEIGHT how important each dimension (political, economic, foreign affairs, military, and casualty) is to you by assigning a numerical value on a 0 to 10 scale ('0' represents the least important and '10' represents the most important). The WEIGHT box can be found at the end of each dimension row.

APPENDIX B

The Scenario:

Domain of Gains

400 of U.S. citizens are currently held hostage by a radical political organization in a rogue country, Gretania. The group demands that we terminate our military presence in that region.

This crisis has drawn tremendous media attention from all over the world. You, as the chief executive of our country, need to make a decision to deal with the crisis. Currently, within the U.S.:

- It is an election year.
- You must be VERY careful as to how you approach the situation.
- This decision will have a crucial effect on your re-election.
- Your public approval has increased from 52% to 75% during the past three months due to current economic boom.
- Employment rate has increased from 90 % to 95 % in the same period, the highest since 1985.
- Results of recent poll show that 80% of the population SUPPORT your administration's foreign policy.
- Statements made by members within your political party recently have shown that they are very optimistic about the chance of your being re-elected.

Failure to obey terrorists' demand within 48 hours will result in the execution of one hostage per hour. That region is of critical strategic and economic importance to the U.S. due to its rich reserves in both oil and uranium.

This crisis has political, economic, foreign affairs, military, and casualty implications.

Your advisors have suggested the following alternatives to deal with the crisis:
Yield: Give in to the demands by the radical group completely. Withdraw our military and shut down our bases in the region within 48 hours.
Negotiation: Negotiate with the leaders of the radical political group on terms and conditions for releasing the hostages.
Third-party Mediation: Request a third party, a country or an international organization, to mediate the crisis.
Rescue Mission: Send in military special forces for a rescue mission, in hope to rescue all hostages.

In order to help you perform your role, we have provided you with some critical political tips on presidential decision making:
1. Leaders are concerned about their popularity and about their chances of being reelected.
2. Leaders know that the use of force bring about a ‘rally around the flag’ effect and thus increases their popularity.
3. Leaders also know that a failure in military actions is likely to reduce their popularity.
The decision board will indicate how each alternative is evaluated on each dimension

(i.e., political, economic, foreign affairs, military, and casualty) by your advisors. The evaluations are summarized as a rating on a 21-point scale (-10 implies that the option is evaluated in an unfavorable way, 0 implies a neutral position, and 10 implies a favorable evaluation).

The information your have received from your advisors are presented in the decision matrix at the bottom of the screen with Alternatives heading the columns and Dimensions as the rows.

A decision has to be made. Please begin to explore the evaluations given by the advisors, and then determine your choice. Before clicking the 'Final Decision' button at the bottom of the page, please also WEIGHT how important each dimension (political, economic, foreign affairs, military, and casualty) is to you by assigning a numerical value on a 0 to 10 scale ('0' represents the least important and '10' represents the most important). The WEIGHT box can be found at the end of each dimension row.

APPENDIX C

The Decision Matrix:

	YIELD	NEGOTIATION	THIRD-PARTY MEDIATION	RESCUE MISSION
POLITICAL	Give in to the demands by the terrorists, the public will think the government is incapable and weak. It will have devastating impact on your election. **-8**	Negotiation will show weakness to the public and may damage the public trust towards the government, as previous Presidents have made clear that the U.S. will not negotiate with terrorists. Failure of negotiation will have devastating consequence on your election. **-4**	Mediation helps politically since there are previous incidences that hostages were released due to mediation. Mediation will however show that the government needs external help in solving crisis like this. **+2**	You will appear strong and tough in time of crisis. It is very likely that your popularity will increase tremendously if the mission succeeds. However, failure of the mission will certainly be devastating to you politically. **+8 or -9**
ECONOMIC	Withdraw from the region will greatly damage our economy. We will lose control over rich oil resource, which will increase the price of gas in the domestic market. U.S. companies that have invested in the region will be very likely to withdraw their money due to security concerns. **-8**	Negotiation will incur uncertainty, which may destabilize the stock market. **0**	Mediation by the third party incurs great degree of uncertainty. The level of confidence with regard to the market will decrease. **0**	Use force will create an economic boost as well as maintaining US economic interest in the region. It will also show investors that the government is determined to protect economic interests by all means. **+8**
FOREIGN AFFAIRS	Yield to the demands by the terrorists will greatly damage our reputation as the major power in the international community. It will damage our image in our allies. It will also encourage similar incidents in the future. **-8**	Negotiation will show the world that U.S. does not always have to resort to the use of force. It is willing to resolve a crisis through peaceful means, even with a political group from another country. However, it will also imply to other terrorist groups that the U.S. is willing to bargain on such matters. **+4**	Mediation will rally strong support from the international community. It will dilute the image of the U.S. being 'bullies' or as the world's policeman. However, it implies that the U.S. is willing to bargain on such matters. **+6**	If the rescue mission is successful, it will effectively demonstrate the power and might of the U.S. to other terrorist groups and other countries. However, no matter what the result of the rescue mission will be, the U.S. government will be criticized by some human rights groups for taking so risky an option that may risk all the lives of the hostages. **+1**
MILITARY	Yield to the terrorists will damage the credibility of U.S. military forces. It shows that military is unable to protect our interest and effectively strike against terrorist actions on U.S. citizens. **-8**	This will show that the U.S. does not always use military means to resolve crisis. However, negotiation will damage the future credibility of U.S. military force. **+4**	This will show that the U.S. does not always use military means to resolve crisis. However, there is a possibility that mediation will damage the future credibility of U.S. military force. **+1**	The use of rescue mission shows that military is determined to protect our national interests and the lives of U.S. citizens. It may deter future terrorists' acts on U.S. interests and citizens. However, failure of the mission will also greatly damage the reputation. **+3**
CASUALTY	Yield to the terrorists' demand may save the lives of the hostages, assuming the terrorists will abide by their promise. **+8**	If negotiation succeeds, no lives will be lost. However, if it breaks down, terrorists may start killing hostages. **+8**	If mediation succeeds, no lives will be lost. However, if it breaks down, terrorists may start killing hostages. **+1**	It is very likely that, given the rescue mission being successful, some hostage are still going to be killed either by the terrorists, or by friendly fire. Also, U.S. military soldiers may die in the mission. **-9**

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